The Builder.

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Architecture in Central Asia.

SOME contributions to our knowledge of the architecture of that little-known part of Asia which lies to the east of the Caspian Sea and to the south and south-east of the Sea of Aral may be picked out of a book published not long ago by Messrs. Allen & Co. on the subject of the Russian movement on Merv and Herat. It would be a great advantage to the study of architecture if travellers in little-known districts made a point of giving the best and plainest account within their power of the structural features of the countries which they traverse. In our present state of education, however, it is useless to expect this, except in the rare cases where some kind of technical knowledge has been previously acquired by the traveller. So we must be thankful for what we can get, especially when we remember that poor photographs or even rough sketches will often tell us more than pages devoted to what is, perhaps, intended for descriptive writing.

Outside of the new Russian province beyond the Caspian lies a region, more or less unexplored, which has provoked the curiosity of enterprising Russians. In 1881 a Russian railway from the Caspian to Kizil Arvat was opened for traffic; the distance from Michaeovsk, on the Caspian, over steppes unfit for the support of human life, being 144 miles. The fertile and well-watered oasis of Akhal commences at Kizil Arvat, and there is no doubt that a continuation of the railway through the district in a south-easterly direction, to Askabad, Sarakhs, Herat, Candahar, and Sibi, is perfectly feasible. The distances are, from Kizil Arvat to Askabad, 135 miles; Askabad to Sarakhs, 185½ miles; Sarakhs to Herat, 202½ miles. Total length from the Caspian shore to Herat, 667 miles. The cost of a railway for the unfinished portion (523 miles) of the route, is estimated at 2,192,000*l*.

The district between Askabad and Sarakhs is known as the Atak, which means "The Foot of the Mountain." The people of the Atak dwell partly in clay structures and partly in *kibitkas* or tents. The number of tents, however, is on the decline. Formerly every settlement consisted in a fort, or *Kala*, inside of which were clay buildings, and outside tents, that could be removed into the fort at any moment. At present the structures erected outside the forts are also of clay.

At a distance of 8½ miles from Askabad lies Annau, an old half-ruined fortress on a hill, with an *aoul* or village of 200 huts, half a mile from the fort, which is surrounded by extensive ruins, and stands on the banks of a stream. Annau is the first locality, proceeding from Michaelovsk Bay, where there are traces of art. The ruins of a mosque here exist. Many of its towers have fallen, and all the arches and walls are cracked, but the elaborate and graceful façade is still perfect. As far as Giaurs, some 18 miles to the south-east of Annau, the Tekkes live mostly in *kibitkas*. Advancing towards Askabad, 135 miles from Kizil Arvat, there are ruins of clay homesteads, but in small numbers. Tombs, built of unburned brick, are more numerous. They are ugly quadrangular buildings, surmounted by domes, and plastered over with clay. The façade of one of these tombs, near Artchman, is figured in the book. A plain wall, about 20 ft. high, is divided into vertical panels by four pilasters, two more being placed at the outside angles. In the centre panel is a square opening, some 4 ft. 6 in. in height, the sill of which is about 3 ft. above the ground; and there is a sort of window, some 2 ft. high by 1 ft. 6 in. wide, above the opening, near the top of the wall. A rude string-course runs along the face of this wall, at about 2 ft. 6 in. from the top, and the swell of the dome which covers the quadrangular interior rises some 10 ft. above the latter. The building appears to have been formed as a cube, with the springing of the dome, at about two-thirds the height of the façade, concealed by the carrying up of the plain external walls, which leave only the top of the dome visible from the ground without.

At Durun and Paran, near Kizil Arvat, are ruins of small mosques in a bad state of preservation; and on the banks of the old channel of the Oxus are parts of the walls of four monumental edifices, still standing. They are not said, however, to possess any architectural features of interest; nor can the inhabitants give any account of their history. Some of these tombs recall to mind the Makams, or "High Places," of Eastern Palestine. The Mosque at Annau is said to have been built in honour of some Moslem saint, whose memory has perished. His tomb is pointed out near the mosque,—a mere mound of earth dressed with stone, and surrounded with a stone wall, the only entrance being one through which it is necessary to crawl in order to pass it.

At Giaurs there are three fortifications, of which one is occupied by forty Tekke families, living in mud hovels within the inclosures, and one is in ruins. It may be as well to take such an account as can be given of Merv itself as generally descriptive of both the fortifications and the residential buildings,—or rather construction of hovels,—in this wild part of Asia. The northern front of the fortress of Merv appears as thin blocks of plain massive walling, nearly perpendicular, retiring at right angles towards the interior, and without any embrasures or openings, although a slight irregularity of outline on the top suggests the presence, or the former presence, of battlements. As against an army provided with artillery it is hardly to be thought that any defence is possible, although these fortifications, which as far as we can make out are of the nature of redans, or forts open behind, might be formidable enough as checks on the marauders of the district.

The description given of the erection of these defences is enough to account for their rude and inartificial character. After the fall of Khiva in 1873 a rumour reached Merv of an intended attack by the Russians. On this the Khan collected 25,000 labourers, and began to construct a fortress on the banks of the Murghab. After they had been at work for twenty days the news of the retreat of the Russians arrived, and the work was discontinued. In 1880, during the siege of Geok Tepé, it was resumed, by the same number of workmen, and carried on for three weeks. It was then again abandoned, on the intelligence that the Russians were not likely to march upon Merv. The general form of the fort is that of a triangle, and the river runs between it and the market-place of the town. The extent of the works is about 5 miles. The earthwork is nearly 80 ft. high from the foundations, and bears a parapet 35 ft. high. There is no proper ditch, but a wide excavation, both within and without the walls, from which the material for the latter was dug. There are eight gates, the roadway zigzagging behind a projecting fort and passing between two forts in the second line.

A rough drawing that is given of an *aoul*, or village, within these rude and massive lines of earthwork, can only be described by saying that it resembles the arrangement of a series of large bee-hives in a hollow square. Round in plan, and curving at top into a sort of pointed dome, these huts are as close to the form of the ordinary straw bee-hive as can be well imagined, excepting that the entrance, which has a head of pointed form, rises to about half the height of the hut. Nothing in the shape of a window is shown, nor much in the way of door. Each row of hovels stands on a sort of daïs or platform, elevated about 14 in. above the central part of the square. Rude square towers, each perforated with a single loophole, or window, rise at the corner of the *aoul*, and form part of the fortifications of the town.

There is a very remarkable resemblance between the oven-shaped hovels that form the "houses" of Merv, and those circular cells to which we have before now called attention in connexion with rude stone walling and megalithic structures in Cyprus. The same type is perpetuated in the round, conical-topped haystack, or rather wheat rick, which over a wide breadth of our agricultural districts is found side by side with the rectangular form of rick. Of the two shapes there can be little doubt that the circular form is the older, and that for this

reason. In building a single house, less material is required to wall in a circular area, of given extent, than by the use of any other ground-plan. And thus, in point of fact, in Mediæval or still earlier times, the round tower was a great favourite for defence and even for abode. But with the increase of population, and the coincident demand for house-room, the outside corners, wasted by circular plans, assumed an economical importance, which more than counteracted the saving in masonry. A house, cell, tower, or what not, standing alone, might be best built on a circular plan. But build many together, and the rectangular disposition becomes indispensable, or, at all events, becomes the best.

We have a remarkable analogy to these two forms in the nests of the honey-bee and of the humble bee. Of the economy of the hexagonal form adopted for the cells of the former it is superfluous to speak. Theory and practice here so accord that it is alike true to say that the form which is mathematically the best has been selected by the instinct of the "singing masons, building roofs of gold," and that the most convenient disposition that practically would work itself out among a great number of closely-packed fellow-workers had come into natural operation. Both statements are true. But the nest of the humble bee, which is made of a paper (formed by the labour of the insect), very like that which forms the nest of the wasp, is a collection of circular cells, that very closely resemble the clay hovels of Merv, or the round cells of Cyprus. And as, in the order of what we may call insect civilisation, the politic and far-seeing honey-bee holds a rank as much superior to that of his larger and noisier brother as the citizen does when compared to the nomad, so must we hold that the oven-like hovels of Merv are survivals of one of the rudest and earliest forms of house-building.

It is, however, evident that architecture of a higher order has been not unknown in this part of the world. Whether any remains deserving of serious study exist is at present doubtful. The region is in a late stage of that relapse into desert which in so wide a part of once-populous Asia has become so complete. Much of the district, indeed, is yet gifted with extraordinary fertility, under the one main condition of abundance of water. But that abundance can be supplied only by irrigation. Irrigation implies the existence and maintenance of canals, and no such care of the physical needs of the country is possible without a settled government. A sort of No Man's Land, too remote from the seat of Government of Persia to allow of effectual control, that part of Asia is now in a state of transition and of decay. How far the state of the case will be altered by events now in progress, including the main step of the construction of a railway as above described, it is not for us here to speculate.

THE ROMAN BATHS AT ST. BARBARA, TREVES.

A DISCOVERY AND A RESTORATION.

THE stranger who wishes to see the sights of Treves, or Trier,* and who would ask for the ruins of the Roman Baths, would be sure, in eight cases out of ten, to be sent to the ruins of the Imperial Palace, whilst he might be once questioned whether he really meant the baths, and not that palace; and only in one case, if he had luck, would he be really directed, without preliminaries, to the suburb of St. Barbara, where the desired baths are actually situate. A German writer who supplies a description of the ruins from which we quote says that this persistent confounding of such entirely different things must be described as a strange peculiarity of a city so rich in rare treasures as Trier, which at the same time supplies a proof of the almost convulsive stubbornness with which a generally accepted designation and an error which had taken root long ago preserve an existence difficult to understand and scarcely justifiable. No excuse can be found for the name "Roman Baths" which attaches to the massive ruins of the large Roman edifice rising in the south-eastern part of the city, and which designation dates from the beginning of the last century, for later researches have shown without doubt that the canals and passages, looked upon as parts of a bathing establishment, did not serve any such purpose, but that they were merely used for heating. Even if the name of Imperial Palace should finally be questioned, it is, on the other hand, fully proved that those ruins were not baths. It is difficult to understand why, in the face of this, the photographic views of that palace, exposed for sale in large numbers in the shop-windows of Trier, should bear almost universally the subscription of "Roman Baths," and why even the latest-published plans of the city should perpetuate this erroneous description. Although the perpetuation of such an error in print cannot be forgiven, there is some excuse for the popular usage, which cares little for archæological investigation. People have become accustomed, so far as the memory of the present generation reaches, to look upon the lofty massive remains in the Palastplatz,—where in the time of the Romans there was also the Forum,—as baths, combining with this designation, quite correctly, the idea of a splendid building. But it is just on this account that people do not seem to care to drop the popular appellation, and to transfer the name to the lately discovered ruins of the real baths, which scarcely rise above the ground. And yet those ruins are, for him who understands how to read ruins, and who is able to reconstruct in his mind's eye from existing remains what has been destroyed, of a grandeur not inferior to that of the Imperial Palace, and perhaps even grander.

As already remarked, the ruins of the Roman Baths are situated in the suburb of St. Barbara, south-east from the city, and not far from the river Mosel. Several attempts to lay them bare were made as early as the beginning of this century; but operations were soon again abandoned, notwithstanding that several very good finds,—one of them of a very valuable nature,—were made, and they were at no time carried on systematically. It is only since July, 1877, when a committee of the Rhenish provincial museums granted a sum of 22,000 marks towards excavations, and since the spring of 1881, when the Prussian Government resolved to acquire the site, to excavate the ruins, and to preserve them for ever, that the works have been prosecuted energetically. Lately the German Crown Prince, who visited the ruins last year in company with the Crown Princess, has also shown his interest in the work by forwarding a subscription of 10,000 marks, so that during this summer additional workmen could be employed, and about two-thirds of the extensive ruins have been laid bare. Dr. F. Hettner, under whose careful supervision the work has been proceeded with, hopes to complete the excavations,—the most elaborate, by the bye, that have ever been carried on on German soil,—by next autumn. When, by that time, the widely-ramified passages, the floors of the halls, rooms, and courts, as well as the remains of the walls, unfortunately very low, have been entirely cleared from earth and rubbish and cleaned, a picture will be unfolded to the visitor which is, indeed, the ground-plan of an immense building, the lines of which, instead of being traced with Indian ink on paper, will be marked by walls on the ground. In order to obtain a better view of this plan, an earth mound has been thrown up in the centre of the ground, from the platform of which a tolerably fair view may be obtained of the whole. But this hill, which takes up too much room in proportion, may be looked upon as only a makeshift, and will probably be replaced later on by a tower of iron framework, placed at a suitable spot. At the present time, the best view may be had from the elevated high-road running along the north side of the site now being excavated, and from this point of vantage the imagination is able to re-erect, with the help of the ground-plan as exposed, the magnificent edifice which once stood there.

The writer above mentioned says:—Right in front of us lies an extensive courtyard, which at its farther end is bordered by a centre building, and to the right and left by two boldly-projecting wings. According to measurements made by Regierungsbaurath Seyffarth, those wings project 139 ft. 6 in., and have a breadth of 71 ft. 6 in., whilst the clear space of the courtyard before us, or the breadth of the centre building, is 423 ft. 3 in., which would give for the whole building a breadth of 566 ft. The centre portion, as the most elaborate part of the whole, was richly membered, and contained two principal entrances, each flanked on either side by a niche, two of which may have contained fountains, the other two being filled by statuary of Parian marble. Before passing through one of these entrances, it is necessary to remark that the ground-plan of the whole building is strictly symmetrical, and that the symmetric axis passes from north to south between the two entrances, which latter are placed 92 ft. from each other. Through the whole centre, from north to south, at a depth of about 330 ft., there runs a series of halls and rooms placed behind each other, on to which join to the right and left the other rooms, exactly corresponding on both sides. Through the two entrances, spanned by barrel vaults, the porch was reached, whence a few steps of a total rise of 3 ft. led into a large hall.

This hall, part of the frigidarium, containing the cold baths, forms a parallelogram of 177 ft. by 66 ft. It formed, as it were, the reception-room of the whole, and was consequently fitted up with the greatest luxury. Being almost a whole story higher than the surrounding rooms, its importance found full expression in the exterior of the edifice; it was also spanned by a massive barrel vault, and received its light from all four sides through windows placed high up. Here the greatest splendour was displayed. The floor was formed of white and black marble slabs; the walls were inlaid with Cipollino and other precious kinds of marble, and the vaulting was covered with mosaic work. The principal hall was surrounded on all four sides by smaller halls, or hall-like enlargements, communicating with it direct, and without separating walls. At each of the two narrow sides, east and west, communication was preserved by a large room; but each of the two long sides was divided by two massive columns into three equal parts. On the north side they opened between the two principal entrances into a semicircular apse, with spherical vault; on the south side, to the right and left of a lobby leading to a large hall placed farther back, into two square rooms. The two latter, as well as the semicircular space of the apse, were entirely taken up by large cold-water basins for public bathing, whilst close to them were six cells for cold private baths. From the principal hall of the frigidarium, through the above-mentioned hall-like lobby, which was closed to the right and left by small semicircular apses, and through two wide doors, the large centre hall located behind them was entered. Both this lobby and the contiguous hall were decorated with great splendour. Glass mosaics, Cipollino, and other valuable stones, covered the walls, which were divided by pilasters with capitals of white marble. These two rooms served as the communication between frigidarium and caldarium, between cold and hot baths. The northern portion of the central hall was accordingly supplied with a hypocaustum, or heating chamber, placed under the floor, supplying sufficient warmth to the whole space, which served as an intermediate resting-place to those entering the caldarium from the frigidarium, or *vice versâ*. Behind the central hall the principal hypocausts, or heating apparatus, as well as the rooms for the attendants, were placed, whilst to the right and left were grouped those rooms which served for the warm baths proper. The latter correspond to the perfectly symmetrical arrangement of the whole; as already observed, there are two groups of them, to the right and left of the heating arrangements, which were placed in the centre.

This plan favours the assumption that the warm baths were used by the two sexes separately; the cold baths, on the contrary, in common. The fact, also, of the frigidarium being most luxuriously fitted up, whilst the spaces included in the caldarium were simpler in their arrangements, likewise supports this view. We also know that, especially during the times of the last emperors, the public baths lost much of their original purpose, and served more as assembly-rooms and places of enjoyment for the fashionable world than as actual bathing establishments, a state of things which prevails in this nineteenth century in many of our seaside resorts. In the centre of each of the above two groups of warm baths there is a large rectangle, rounded out at the narrow southern side into a flat apse. These were the caldaria proper, forming single large basins for the public warm baths. Around them were ranged the various other rooms prescribed by the highly ingenious arrangement of Roman baths and the *bon-vivant* habits of their builders. There were the apodyteria, for undressing and dressing; the tepidaria, with moderately dry heat as a

* Illustrations of these will be found in our early olumes.

preparation for the bath proper; the unctaria, in which the body was anointed with oil before and after the bath.

The whole building is surrounded on its two outer sides, as well as along the whole length of its rear façade, which, like the front, faces a spacious courtyard, — which, again, is encompassed by a series of cells serving as private baths,—by a broad vaulted tunnel, which likewise crosses the interior of the building in various directions. Narrow stairs lead from the open courtyard and from different other parts of the edifice down to this subterranean passage, which served exclusively as a means of communication for the attendants employed, and for the service and regulation of the heating arrangements, which were mostly underground; it also contained the drains. This large tunnel and a sewer passing right across the whole building are the proportionately best preserved parts of the baths, whilst the caldarium to the left, which has been exposed quite recently, awakens, perhaps, the greatest interest. The floor of the latter, which consisted of a kind of platform made of broken tiles and thin cement, and rubbed smooth at the top, rested upon a hypocaust, a hollow space formed of many columns and heated by hot air, which warmed the water above it. These columns, constructed of tiles loosely piled upon each other, have broken down under the weight of earth and rubbish accumulated during fourteen or fifteen centuries. The floor has been burst open on all sides and tumbled down, and can only be compared at the present day with a shattered ice-field, the broken slabs of which show in their fracture that they were formed of three separate layers, each of which, curiously enough, had been carefully rubbed smooth.

As already remarked, there remains, unfortunately, nothing of the whole splendid building but the foundations, the subterranean spaces, the partly preserved floors of the rooms above them, and low walls, nowhere higher than about 6 ft. Those walls consist partly of small unhewn limestones, at the corners also of massive sandstone blocks, partly of concrete walling with layers of tiles running through it, and faced with carefully-dressed limestone slabs. The grandeur and beauty of the edifice, besides the aids imagination gives us from the remains, may be gathered also from a drawing preserved in the Town Library of Trier. This drawing, contained in Wiltheim's "*Luxemburgum Romanum*," but unfortunately not very clear, shows the ruins of the side facing the Mosel still preserved to a height of three stories, as they appeared at the beginning of the seventeenth century. The ruins then still displayed a building with circular windows, adorned by pilasters. There exists a record of the ruins also in the so-called Merian plan of the town (dated 1646); and if we accept a verbal tradition, according to which the materials of the ruins were used in building the Jesuits' College, as substantially correct, the statement of Merian may very well be reconciled with this version, for the year of erection given on the college is 1653.

An idea of the former splendour of the building and its various halls may be conceived from the numerous finds, remains of floors, stumps of columns, shattered marble capitals, torsos, glass mosaics, painted stucco, bronzes, and many other smaller objects. With few exceptions, all those finds have a resting-place in the Trier Provincial Museum. The most notable of them is the large marble torso of a female figure, which was discovered in the winter of 1845 in front of one of the niches by the side of the principal entrances, and which was soon recognised as an imitation of the well-known Mattei Amazone preserved in the Vatican. But it was found, after careful comparison, that the torso at Trier is far superior to that at Rome, both on account of freer and more unrestrained treatment of the drapery and the more natural appearance of the flesh, and that, although less complete than the other, it has claims to higher artistic value. Of other statuary which had served for adornment, there were discovered a small male bust, a plinth with a human foot, a very beautiful female hand broken off short, and a smaller torso of a male figure, all of Parian marble; small figures of clay, among them a couple in an amorous posture, and others of bronze. The architectural remains include a polychromatic cyma of mortar, and fragments of mosaic and fresco paintings. The objects most numerously found were, of course, those connected with the destination of the building. Amongst them are small pots, bottles, and sigillata fragments, many keys, pins, buckles, a small bronze scale, and, as a matter of course, a very large number of combs, hairpins, lacing needles, ear-prickers, partly of horn, partly of bone; but not a single strigilis,—that article of the toilet principally used by gladiators after their fights, and with which they scraped off in the bath the ointment, mixed with dust and blood, which they had applied to their bodies before they entered the arena. It is surmised that there may have been close to the Roman Amphitheatre, which, situate on the road to Olewig, is some distance from the Baths of St. Barbara, another public bath, intended for the gladiators and less aristocratic visitors generally. But, at any rate, it may be assumed that during the period when the Augusta Trevirorum was raised by the Emperor Diocletian to the rank of western capital of the Roman Empire, and when, in the fourth century of our era, the Emperors Maximian, Constantius, Valentinian, and Gratian took their permanent residence there, whence they directed the destinies of Gallia and Britannia, the most select Roman society was assembled at Trier, and that the splendid Baths of St. Barbara were probably erected for them in the first place.

IMPROVED CONSTRUCTION OF THEATRES.

THE safety of our daily-increasing theatre-going public is a subject which of late has been somewhat seriously forced on the attention of the world, and no small number of remedies have been suggested and in many cases carried out, but still there remains, it must be confessed, much room for improvement. A considerable field for study, it may be observed, is offered by some of the more important of the Continental theatres.

There is one special measure adopted by the Austrian authorities to facilitate the exit of theatrical audiences, a measure to which we would particularly desire to draw attention, as one eminently practical, and easy of application. In the impossibility of isolating existing theatres,—a point which should in the future, we consider, be rendered obligatory on all managers,—the means which have been adopted in Vienna and in Prague, of establishing exterior iron staircases from each story, should immediately be enforced by the Metropolitan Board of Works in every London theatre. The facility with which a window on any floor can be converted into a door, and from it a light exterior iron staircase run down to the street, must be apparent even to the most unpractical mind, and no better argument in favour of the complete success of this system could be adduced than the facility with which an audience finds its way out of the cramped, old-fashioned Burg Theater of Vienna. All who may remember the quaint and famous little house in the past would be astonished to see how simple is the mode of exit now that from each story a light outer iron staircase has added a whole series of additional exits. These exits are, it must be specially observed, used *every night*, and not merely reserved for cases of need. We fail entirely to see the reason why all exits, if exits they be, should not be used every night, and this, not alone on the score of the comfort of the audience, but chiefly that the public may in this manner become perfectly accustomed to the use of more than one or two exits. A curious proof of the necessity of this feature was given not long since in one of the crowded houses of Vienna, the little Theater an der Wien, where a false alarm of fire having caused a panic, it was found that, notwithstanding that the public might have been supposed to have become accustomed to the extra exits, they were used but by only a few persons.

At the Prague Opera-house, not a very large theatre, but entirely isolated, the system of exterior staircases, only just completed, is admirably arranged, a long balcony running round two sides of the house on each floor, the various exits all opening on to the balconies communicating with the street by a series of staircases. Both in this case and in that of the Burg Theater at Vienna, the daily use of these extra exits has singularly served to allay the fears of the theatre-going public. At the Viennese Burg Theater the last few steps of the iron staircases are, it may be mentioned, movable, and are fixed each night when the doors of the theatre are opened; thus the day traffic is in no way impeded.

This inexpensive and very efficacious system of exterior iron staircases has been adopted in Austria and Germany in more than one of the smaller houses; in the larger theatres, in the principal opera-houses, such measures are unnecessary, the staircases being amply broad and the separate exits numerous from each portion of the house. In the Berlin Opera-house the spectator in the highest gallery finds himself on the piazza before the Emperor's palace, and by a separate staircase, almost before he knows he is in the open air, and on the opposite side of the house, and from each story a similar exit is also provided. In Professor Semper's superb new opera-house at Dresden,—one of the most successfully-designed theatres in the world,—the means of entrance and exit are admirable. It is difficult to imagine the possibility of accident even in the event of panic. At the opera-house at Munich distinctly-marked arrows, beneath the word *Ausgang*, direct the spectator at every turn to the numerous means of exit from the building. At the Vienna Opera-house the double staircases are so broad and easy of ascent and descent, the doors are so numerous, that no panic could, we should imagine, possibly block the means of exit even when the house holds its full complement of 3,000 persons. These, of course, are large houses, in the design of which the economical consideration of space has never been a point such as it has been and is, in the case of most of the theatres of the great cities. But in the future erection of all theatres the Board of Works should, we consider, be far stricter in its requirements than hitherto it has been. Isolation, no matter what the cost, should be made, in all but exceptional cases, obligatory, certainly on two sides of the house. Exterior iron balconies and staircases should be equally obligatory, this latter feature being also enforced in all existing theatres. As for the further measures of interior security those have already been well discussed and require only to be more strictly followed to lessen considerably the chances of danger.

Above all things the confidence of the public must be secured, and we know of no better method than that which is adopted in Munich, of admitting the public on certain days of the week to visit the great opera-house and the adjoining Residenz Theater, before and behind the scenes. When one has fairly seen the admirable system of water-tanks and hose-pipes, the ponderous iron curtain that descends in fifteen seconds, and the general working of the carefully-observed rules which have been drawn up for the observance of all employed behind the scenes, when one has had explained to one the facility with which the smallest commencement of fire can be quenched even amidst such a mass of inflammable matter as is always crowded behind the footlights, it is singular what confidence is established in the most timorous mind. This admirable system of admitting the public to visit during the day-time the mysterious world of the theatre behind the scenes is one the adoption of which we would warmly advocate in England. In Munich, the proceeds of the admission, by cards, go to aid the funds of the *employés*, one of the firemen usually serving as cicerone. In a city visited by so many strangers as London, the sums acquired by this means would form no inconsiderable additions to the benefit funds of each theatre, while this unprofessional inspection of the public would serve in no small measure to keep managers up to the necessary standard of care.

If we have not a little to learn from foreign theatres in the matter of modes of exit we have, perhaps, quite as much to learn in the direction of simplifying our modes of entrance, and increasing their comfort. The entrance to the better parts of our houses leaves, doubtless, little to desire; but why the entrance to the pit and gallery of most of our successful London theatres, even those built only within a few months, should be commonly scenes of disgraceful and often dangerous riot is more than anyone who is familiar with Continental theatres can explain. It is not of the absence of the admirable foreign system of the *queue* that we are at present speaking, though that may,—and it would appear has, in one case, been,—ensured by the simplest of police measures. Much of the difficulty is due alone to the primitive nature of the entrance pro-

vided. Why, in the case of the gallery, which in the present day is becoming more and more frequented by the respectable classes, — the price of admission has been doubled within only a few years,—the pay-box, a miserable hole in the wall, should be established, as it is in most theatres, at the top of a risky and winding flight of steps, and after the public are crushed through a veritable funnel, admitting only one person at a time, is a point which no one has yet, we think, been able to explain. Abroad, such absurdities are unknown. The pay-boxes for all parts of the house are generally, — throughout Germany and Austria universally,—established in the principal vestibule on the ground-floor, those for the higher-priced places on one side of the vestibule, those for the lower-priced on the opposite side, though in many theatres there is but one pay-box for all parts of the house; a *queue* is thus inevitably formed, as it is in many of our railway stations, which, indeed, the system resembles. We can understand that in the past there was a necessity for a separation of the various pay-boxes, at least so English managers seem to have believed, though this system of separation is scarcely known on the Continent, certainly not in aristocratic Germany and Austria, while in republican France the plan of first and second *bureaux* is only confined to certain houses. In the present day such distinctions are unnecessary. When our Continental neighbours freely allow to all sections of the community a common entrance, we fail to see why we in England should not do so as well, particularly when no objections have been found to exist in the foreign system.

In Germany and Austria the entrance to the great opera-houses, where all enter at the same doors, and pay at the same boxes, is further facilitated by the house being divided "right" and "left," each ticket being thus marked. This is a point which we warmly enjoin on the architects of all theatres about to be built,—the consideration of admitting the audience generally to the central vestibule which already exists in every house. Abroad, the crowding and crushing and positive danger endured by English audiences are unknown,—in the first place, owing to the existence of the two or three pay-boxes in the vestibule entered by several doors; in the second place, because in Germany and Austria the house is opened an hour previously to the commencement of the performance. In France and Belgium the *queue* system, jointly produced by the aid of the public themselves, the police, and a temporary series of barriers, avoids all unfair crowding and crushing, and insures to those patient enough to wait the place that is too often in England seized by some broad-shouldered jostler, who succeeds in ousting every one from his place.

Now that our public is at length putting aside the puritanical traditions which have so long in our country interfered with a genuine love of the theatre, and now that, as on the Continent, the theatre is entering more and more into our every-day life, it is clearly the interest of managers to do everything in their power to encourage this taste. There are many little features that may safely be adopted that have for years existed abroad; the universal employment of polite and uniformed attendants in every portion of the house without distinction; the introduction of the delightful system observed through Austria and Italy of handing round glasses of cold water,—a genuine luxury in an over-heated theatre, after a doubtfully digested dinner, and affording the architect ample field for the design of picturesque fountains.

As for the matter of ventilation, that also requires, in the interests of the public, most earnest consideration. There, at least, we have but little to learn from our Continental neighbours, who suffer in their theatres as much as we do in ours. The electric light has, without doubt, to a great extent, solved many of the difficulties attendant on the use of gas, and to the still greater development of Mr. Edison's wonderful discoveries the theatre-goers must, we suppose, for the present, trust for a future alleviation of the sufferings they so often undergo from heat and from cold draughts. The day that the last grand central chandelier has disappeared from our theatres will be a memorable one in the history of the stage; for then at length a visit to the theatre will cease to be what it at present too often proves, a singularly uncomfortable mode of enjoying one of the most instructive of all pleasurable relaxations.

A PHOTOGRAPHIC LIBRARY OF REFERENCE.

THOUGHTLESS critics are apt from time to time to accuse the officials of our great national collections of a want of respect to the general public, and an indifference to its legitimate claims on their attention. An expression, therefore, of something more than commonplace gratitude is due to the authorities who of late have been so clearly showing an earnest desire to lay before their visitors the treasures under their charge. At the British Museum, since the removal of the Natural History specimens to their new home, the utmost activity has been displayed in bringing forward objects long hidden from the eyes of all but those intimately familiar with the collections, or privileged by acquaintance with their guardians. A certain element of popularity has been introduced in the interesting show of Luther relics, which has been so successfully organised, and one of the immediate effects of which has been, even at this comparatively dull season of the year, to attract a very large number who are far from habitual or even intermittent visitors to Great Russell-street.

In another portion of the Museum the interesting show of autotype reproductions of rare Italian prints, with which the authorities have within a few days past filled the rooms vacated by the collections moved to the Natural History Museum, is of a somewhat different character. To those who may remember Montague House in the remote antiquity of two generations back, such a goodly display of treasures speaks more than all the published statistics of the activity of the department in completing its collections. To the younger frequenters of the Museum these substitutes for the familiar gorilla, the giraffe, the seal, and their somewhat mangy companions, already tend to give the Museum a character in which it, to a great extent, seemed wanting, an element of homogeneity in the aspect of the collections, the instructive interest of which has undoubtedly been increased in a most marked manner.

This step of the British Museum authorities in exhibiting the photographic copies of some of the rarest artistic treasures they possess, is one which merits some attention, for it suggests what might paradoxically be termed the existence of a want. All interested in art matters are well aware of the important position which photography has taken within this generation; with no one more than with the true artist has it been received with favour; by some, a plentiful amount of abuse is heaped upon its creations, by others a vast deal of ignorant talk is indulged in respecting its predicted future. In the meantime, its already numerous applications continue to increase, promising shortly to revolutionise completely the long-established traditions of the engraver's art, and the kindred art of the book-illustrator. Photography has, in fact, entirely overcome the attacks of its detractors, in all but one direction, that of portraiture, in which, for reasons manifest to every person of refinement, it can never hope to advance beyond its present imperfect and unsatisfactory position. But this purely æsthetic side of the matter once dismissed as a subject worthy alone discussion from the commercial point of view, the services which photography has already rendered and still can render to art and to science it is impossible to over-rate. That sad and seemingly inevitable inaccuracy of the draughtsman generally,—still a vice which has not disappeared,—has been greatly corrected by the photograph, which has superseded the necessity for the use of the camera lucida, without the aid of which it was all but impossible previously to insure any trustworthy amount of accuracy. In every direction, the world over, the photographers have been busy; every great monument, every great view, has been fixed on the sensitive collodion, the treasures of the galleries and museums of every country have been and are at this moment being reproduced, and the activity of the photographers, so far from diminishing, promises to be redoubled as the applications and discoveries of science facilitate the working of the various processes in vogue. Through the aid of photography there have been some singular surprises reserved to the artistic world. When some years since the ceiling of the Sistine Chapel was photographed, the real beauty of Michelangelo's long imperfectly revealed work burst on the artistic world as a revelation; and of many other features, pictorial and architectural, the same might be said.

There exists, therefore, at this moment a mass of artistic material which may, without exaggeration, be characterised as enormous; but the mass is scattered over a very large area; what the scientific student would term its dynamic force is in great measure lost, from the absence of any united action.

The artistic value of the photograph, its use to the painter, the sculptor, and the architect, is too candidly admitted by all for any doubts to be even hinted; this value might, by a very small amount of consideration, be rendered even greater. The formation of a permanent photographic exhibition or museum, in which could be gathered together contributions from every possible point of the world, would, we feel convinced, prove to the art student of the utmost advantage. No one who has travelled can say that he has resisted the temptation of expending a not inconsiderable sum in the purchase of photographs. Every painter and sculptor possesses a goodly number of studies, views, and copies of pictures,—every architect a show of professional gatherings from the districts he may have visited, and the use of these as objects of reference no one can deny. They serve the artist as books serve the literary student for whose use the past has handed down to our time many a noble library. In these days, when it is at length understood how important a factor art may and should be made in our existence, the aid of the photographer skillfully directed is invaluable.

All the material exists for the formation of such a museum, exhibition, or collection, as that of which we have spoken, material in such abundance and of a nature that would permit of every town possessing, if it chose, as choice a gathering of specimens as the largest cities. Organised with care, such a museum would afford a means of study by that most invaluable of all methods, comparison. The painter and the sculptor would find the studies from nature and from art by means of which he can alone acquire an acquaintance with his profession; the architect would meet with all the elements of study requisite for a familiarity with his difficult and noble pursuit; while to the general public such a show could not but prove interesting. From an artistic point of view, it would, of course, be matter for regret that any commercial spirit should enter into such a scheme; the purely commercial side of photography should of course be as largely as possible kept out; though, in a measure, it might be largely by an appeal to this spirit that the collection could be formed. The contributions of the leading photographers of every great centre should be solicited with a view to starting such a project; we suspect such a mass of material would pour in as would require at the outset no small amount of organisation.

It is, however, one of the delightful features of artistic research that, far-stretching as its bearings may be, its study, unlike that of science, is essentially exhaustible. It is in the traditions of the past, and an acquaintance with their teachings, that art can alone exist, and these traditions can be distinctly traced in what is, after all, a very small number of trustworthy examples. It is this fact which renders such a proposal feasible. Invaluable collections of photographs already exist in our museums and in private hands. All who have travelled,—even the possessors of limited means,—own considerable numbers of photographs which, alas! are sad and unsatisfactory property when they commence to fade. But the researches of science lead us to hope that the means are close at hand when this deficiency will be overcome. Already there exist a number of processes which may be said to have completely solved the difficulty and ensured the permanence of the photograph.

Such a proposal as this we foresee might be carried out in a most satisfactory manner, and on a scale which would place it within the means of the smallest communities. It is one of the many advantages of photography that its processes facilitate the production of an indefinite number of impressions; with the engraver's art there is a proportionate deterioration as the number of reproductions increases. This is not the case with photography, while its economy has long placed it within the reach of the smallest means. A photographic library of reference, well organised and indexed, a good catalogue prepared, the more attractive and instructive specimens framed and exhibited,

would, we have no hesitation in saying, prove a most acceptable addition to the educational institutions of every large town.

WELLS AND CESSPOOLS.

DURING the recent dry weather there has been a shortness of water in many places where the only water procurable by the inhabitants is that found in wells upon the premises of the houses. Where this inconvenience,—almost, we might say, calamity,—has been suffered, most of the inhabitants have been convinced that "something must be done" to provide against these frequent recurrences of want of water, and there is an unusual activity in local boards and rural sanitary authorities in places beyond the reach of the fine supplies of water procured by the larger towns. Where water is supplied from storage reservoirs in the hills, the effect of a drought is not so much felt, for the reservoirs are large and usually afford a sufficient supply for all purposes during a long drought, without fear of exhaustion. But in small towns and places in rural districts where the inhabitants procure water from wells on the premises the case is very different in a dry time. In some places the wells are intermixed with cesspools, and while the water in the well lowers, that in the cesspool rises. Where the ground is of a very retentive nature, as is stiff clay, there may be no great amount of leakage from the one to the other, but this is not the usual state of things; where the ground is of such a character as to prevent the passage of water from the cesspool to the well, water is not found in the ground at any shallow depth, but the clay is passed through and the sinking of the well is continued down to a bed of sand or gravel in which the water is found, and the water is not, in such a case, derived from the surface immediately surrounding the premises, but comes from a distance, and may be good water. It may also be sufficiently abundant; the bed of sand or gravel, which, at the place where the well is sunk, is overlaid with clay, sometimes extends over a considerable tract of ground beyond the site of the well, and receives a large quantity of the rainfall, which passes underneath the clay to the well. Such a case as this, where a cesspool is dug in clay and receives the house drainage, and a well sunk through the clay to a water-bearing stratum is the source whence the inhabitants procure water for daily use, is a fortunate state of things, but, so far from its being usual, it is exceptional. It may easily be seen that it is so if it be considered that, firstly, the ground in which the cesspool is dug, and which may be called clay, as being mostly so, is very seldom free from other materials which make it not perfectly water-tight, and, therefore, make it possible that water should pass through it out of the cesspool towards the well when the water there is at a lower level than that in the cesspool; secondly, that the outcrop of the stratum of sand or gravel beyond the well may form a tract which is cultivated as farm land, and the rainfall upon it may carry many impurities to the well; and, thirdly, that this outcrop of the water-bearing stratum may be so small in extent as to afford an insufficient quantity of water.

But the more usual state of things is that the ground in which both wells and cesspools are sunk is not clay, but gravel, or a mixture of the two, mostly consisting of gravel. Here we have that unfortunate facility of accomplishing without much labour two things which must necessarily be done for every house, viz., the provision of a receptacle for the house sewage, and a source whence water may be procured daily. Without thought of the consequences the inhabitant of a town digs his well and his cesspool both on his own premises, whatever the nature of the ground is, and considers himself lucky if he meets with water at no great depth; lucky because it has cost him but little labour. He forgets that in ground consisting of the porous materials which allow the rainwater to percolate so easily from the surface into the well the sewage also percolates into it. If he should think to guard against this by making his own cesspool watertight he may possibly do so, but will find it very difficult and hardly to be accomplished without some engineering knowledge; but even if he have this, and should succeed in making a watertight cesspool, he is not sure that sewage may not come into his well from other cesspools. The fact is that in gravelly or other porous ground the water and other liquids maintain a pretty uniform level at all times; and although it is not impossible to make cesspools watertight, those who have them made do not always employ the skill necessary to make them so, and consequently the water passes out of them to any lower level. Now, in a dry time, while the water-level in the well is continually lowered, that in the cesspool is as continually raised, temporarily, until it has sunk to the general level which the ground-water assumes; and during a dry time there is the double disadvantage of a lowering of the well-water and a raising of the level of the liquids in the cesspool.

Is it too late to speak of cesspools and wells on the same premises in gravelly and porous ground, all such things being now abolished? Not at all. They exist to a large extent. They are being done away with, certainly, but slowly. How much time it takes for people to be convinced that they cannot adopt the same habits in a town as they could in a desert, where they would have more room! It may be said that, whether they can do so or not is not questionable, because, in fact, they do; but within the plain meaning of what we say there is no question that people cannot live healthily under such circumstances; nor do they, as a matter of fact. And when men congregate in large numbers they cannot individually do all those things which are necessary to health under the existing artificial conditions of life, but they must be done by an appointed authority in a systematic manner. It might seem to follow upon this that it would necessarily be in a more expensive manner, but that is not so. On the contrary, if each individual were to attempt to carry out for himself the work required for the health of his own household in a town, whether big or little, he would soon find that it would cost him more than it could be done for in a systematic manner by the appointed authority.

But what, it may be asked, is it which is so necessary to enable a community of people to live healthily upon ground which is porous, and where the wells and cesspools are intermixed? There are two aspects of the question; either to provide a water supply from an external source and let the cesspools remain, or to provide drainage to carry the sewage away to a distance, and continue to use the water of the wells on the premises. One of these is absolutely necessary; both are advisable. But against the advisability of both stands the objection of the expense. It is argued that if the sewage be taken away from the premises of houses the water of the wells will be restored to its original purity. It may be so. It would necessarily take some considerable time for the impurities which have been soaking into the ground for years upon years to be thoroughly eliminated, which it would seem can only be done by gradual exhaustion along with the water pumped out of the wells; but when that had been done it seems reasonable that the well-water would be good again.

It frequently happens that the ground is not all alike over the whole extent of a town or village, and, indeed, that there are three distinct kinds of ground,—clay, gravel, and rock, the rock being in some places shaly and in others compact. Some kinds of shale are almost as retentive of water as clay is, while compact rock contains fissures which render it almost as unretentive of water as gravel is. It may, indeed, frequently happen in rock that the spot on which a cesspool is excavated is free from any fissure, but although in that case the cesspool might be almost watertight, yet nearly all kinds of compact rock absorb water, and in that way it gradually escapes to a lower level in a filtered state, carrying with it, however, such impurities as are dissolvable in water. Again, faults, or vertical dislocations of the ground, prevent the passage of water through them, being filled with a compact substance, and thus the level of the water in wells on one side of a street is often several feet higher than on the other side. Indeed, it is a common thing to find well-water vary much in quality in different parts of a town or village, and while the medical officer of health condemns some of the wells, he can say nothing against others, judging from the analyses; but seeing how infrequently well-water is analysed, in comparison with the frequency of its use, it does not seem reasonable to depend altogether upon analysis, but rather upon the broad facts of the surroundings of the wells. But whether or not a supply of water may be necessary in a place where wells and cesspools exist on the same premises, there does not seem to be a possibility of doubt that the sewage should be taken away clear of the town as quickly as possible, and also from villages; and the inhabitants of small towns and villages may congratulate themselves on this, that it is much easier and less expensive per house in these places than in large towns to take away and satisfactorily dispose of the sewage. Numerous difficulties stand in the way of doing this in large towns, which do not exist elsewhere, and although where a large amount of work has to be done there is some saving in individual items, yet the better room to work in and the absence of the complications of old sewers and gas and water mains, make sewerage works in these places less costly on the whole than they are in large towns, and in the disposal of the sewage the advantage is very much greater. Farmers are now almost generally throughout the country eager to have town sewage on their land where it can be delivered to them in suitable places and in something like regular quantities, without too much rain-water. Its temperature is higher than that of the land during the growing times of the year, and it makes the growing season earlier. Then the manurial value is considerable. Water alone, if it could be had of the temperature of town sewage, would be advantageous, but there is abundant proof of the superiority of sewage over water in the growth of crops. It is usual now to exclude heavy rainfalls from the sewage delivered upon land, and so enable the farmer to use it without difficulty, and to divide the land into portions in such way that the sewage can be disposed of at all times of the year.

THE ASSOCIATION OF MUNICIPAL ENGINEERS AND SURVEYORS.

DISTRICT MEETING AT BURY, LANCASHIRE.

ON the 9th inst. a district meeting was held at Bury of the Association of Municipal and Sanitary Engineers and Surveyors. There was a very large attendance of members. The meeting was held in the Council-chamber, which was kindly lent for the occasion by the mayor, and the arrangement of the details of the meeting was in the hands of Mr. J. Cartwright, the Borough Surveyor, on behalf of Mr. R. Vawser, of Manchester, who is the district secretary.

The chair was occupied by Mr. W. H. White, M.Inst.C.E., City Engineer of Oxford, and president of the Association.

A paper on Bury and its public works was read by Mr. Cartwright. He observed that Bury could not, like some of the towns visited by the Association, boast of many antiquities, but that it existed as a town in early Saxon times there was little doubt, having its feudal castle within a few yards of where they were then met. The Romans, too, had left distinct traces in the district in the great road from Manchester to Ribchester, supposed to have been constructed about A.D. 79. The industries of the people, from causes over which they had not full control, were not so progressive as those of some towns of later birth. Ever since the days of Edward III., when the Flemings established themselves in the town as cloth-weavers, the trade had continued and progressed, and the town now possessed probably a greater variety of trades than any other town in the manufacturing districts of Lancashire, amongst these being woollen and cotton manufacturing, machine-making, bleaching, paper-making, &c. Previously to 1846 the town had, strictly speaking, no form of local government save the parish vestry. In that year, however, the Bury Improvement Act was obtained, which gave the Improvement Commissioners great powers over lighting, paving, and scavenging the streets, &c. The town was under that Act and the Acts incorporated with it until 1872, when an Improvement Act giving greater powers was obtained, including power to purchase the waterworks, the markets, the manorial rights, &c., and extending the boundary. In 1876 it was incorporated, with five wards, and ten aldermen and thirty councillors. It is situated on the banks of the rivers Roach and Irwell, which bounded the town on the east, west, and southern sides, the drainage area being about equally divided between the two rivers. The borough included 3,389 acres, and had a population of 52,000, with a rateable value of

226,000*l*. Referring to the waterworks, which were acquired by purchase from the companies in 1872, he said that the total expenditure on capital account on the works was 367,561*l*. 8s. 8d., and the revenue last year was 25,281*l*. 1s., and the expenditure about 27,800*l*., showing a loss of about 25,000*l*. on last year's working. The market-hall, built in 1839 by Earl Derby, lord of the manor, was covered in 1868, and bought by the town in 1872, with the manorial rights and a plot of land, on which had been erected fish-market, piggeries, and slaughter-houses. The cost of the market and manorial rights was 26,500*l*., and of the land 24,750*l*., and there had been since spent on the market-hall, 344*l*.; fish-market, 821*l*.; piggery, 680*l*., a portion of the latter being converted into a slaughter-house, at a cost of 304*l*. The total capital expenditure was 52,400*l*., and the revenue was about 2,200*l*., the expenditure, with sinking fund, being 3,600*l*.,—a loss of 1,400*l*. The gasworks were established by a company in 1828, and they were transferred to the town in 1858. Notwithstanding that additions had been made from time to time, in 1877 the committee reported to the Council that the works had become quite inadequate to meet the demand, and pointed out the desirability of securing a new site in juxtaposition to the railway. Several sites were selected, but the landowners not being willing to fix a price, the idea of a new site fell through, and the committee set about erecting condensers, scrubbers, exhauster, &c., and a new holder. When the lighting season of 1881 arrived the demand was again found to have overtaken the make of gas, and the question of extension, both of carbonising and purifying, again forced itself on the attention of the committee. About this time the statement was made that the electric light for public purposes was established beyond dispute, and the committee visited the Electric Exhibition at the Crystal Palace to satisfy themselves. They could only admit the electric light to be an experimental success, and proceeded with the carbonising and purifying plant, adopting the best known plans. Instructions were given to proceed with the new retort-house, purifier, and meter-house, which are now approaching completion. The old retort-house covered an area of 11,450 ft. with 280 mouth-pieces, capable of producing a million feet of gas per day; the new house covers 20,470 ft., and has 312 mouth-pieces, capable of producing 2,600,000 ft. per day, which is expected at the present rate of increase to provide for eleven years. The retort-benches, &c., were supplied and erected by West's Gas Improvement Company, Maidstone, the mouth-pieces being fitted with Holman's patent self-sealing lids. The charging and drawing machines are also supplied by the West Gas Company. The paper next described the improved Bury Bridge and the tramways, and referred to the widening of Rock-street, plans of which were on the walls. The baths, it was said, were completed at a cost of 35,000*l*., and were opened in 1864. They are well attended, and it is intended shortly to extend them. The annual outlay was about 520*l*., and the revenue 400*l*., so that the yearly loss was about 120*l*. The necessity of new building by-laws was noticed, as well as the objections to the adoption of the model ones of the Local Government Board in their entirety, the Board by their action hindering, instead of helping to secure sanitary buildings. The Hospital for Infectious Diseases was next described, it being on the pavilion principle, with four wards, and having accommodation for fifty beds, with every modern requirement. The total cost was about 3,000*l*. or about 60*l*. per bed. As to the disposal of sewage, nothing had yet been done, but land for purification works had been purchased, and plans for intercepting sewers, &c., were prepared. It was intended to precipitate the sewage in tanks, and then filter it through the land. The sewers were laid in straight lines from manhole to manhole, with ventilation by the manholes; the street grids were all trapped with gullies, to prevent the sewers from being filled with dirt. The length of the sewers was forty-four miles and a quarter. During the last six years twenty miles of sewers and cross-drains had been laid. For the destruction of dust and scavengings one of Fryer's patent four-celled destructor kilns is used. It was completed in November, 1881, and erected in such a manner as to admit of extension without material alteration. The heat evolved from the combustion of the material is utilised for generating steam in a multitubular boiler used in connexion with a mortar-mill, capable of grinding about 10 cwt. of mortar per hour, for which there is a ready sale at about 5s. per ton. The last year's working is 1,312 tons of mortar sold at 5s. per ton, realising 328*l*. 4s. 3d., which, after deducting expenses, leaves a balance to the credit of the mill of 52*l*. 3s. 9d. The arrangement of the flues is such that heated gases can either be utilised through the boiler, or allowed to pass direct to the chimney by a main flue which has been designed, as well as the chimney and other parts, to allow of further extension of the furnaces. The chimney is 180 ft. high. There are an engine-house, store-room, and high-level road, with substantial retaining walls of stone, giving access to the top of the cells, where the rubbish is tipped direct to the charging chambers. The four furnaces are arranged on an inclined plane, charged from the top, and the material after remaining in the furnace two hours is withdrawn in the form of clinkers, being reduced to one-third of its former bulk, and these make excellent mortar with one-third lime to two-thirds clinker. The flues require cleaning out once in two months, when about twenty loads of dust are taken out. About sixteen tons of material are treated per day, an average of 4 tons per cell; the total amount for the year ending March last being 4,352 tons in 6,885 working-hours, at a cost of 1s. 8¾d. per ton for actual working expenses. The original cost and royalty was 3,500*l*. Mr. Cartwright concluded his paper by referring to the important question of street pavements. Traffic in the town, he said, had much increased, and the primitive plan of laying down setts of any material which came to hand upon a bed of loose earth and filling the joints with loose sand, to be washed away after rains, did not meet present requirements. Bury had taken up the question in earnest. With one slight exception, it had been determined, under Mr. Cartwright's advice, to pave the whole of the main thoroughfares with granite upon a concrete foundation. After the removal of the old Haslingden setts the underbed is excavated to the depth required. First is laid a layer of roughly-broken stone and shingle, about 3 in. in size; upon this a layer of cement mortar, mixed in the proportion of one to five with clean, sharp gravel, and upon this a second layer of broken stone passed through a 2-in. riddle; the surface is then beaten with large flat iron beaters until the whole is thoroughly incorporated; then another layer of cement mortar, and upon this a layer of stone, which is beaten as before, and so on until the requisite height and curvature are obtained; a thin coating of cement mortar being thrown over the surface, which is beaten and left smooth to stand for about eight days until thoroughly set before the setts are placed upon it. The proportion of gravel and stone to cement was as ten to one. The joints are filled with pea gravel, and run with prepared pitch. The cement was the best Portland, capable of being sifted through a 6,000 gauge mesh. The setts were 5 in. deep, 3¼ in. wide, and from 4 in. to 6 in. long; they were from the Welsh Granite Company, and from the Darbishire Granite Quarries, Penmaenmawr, and were found to be practically limitless in wear. The following estimate of the cost of the different forms of paving was made, the data being the same in each case:—

	First cost.	Maintenance per year.	Cost per year over 30 years' first cost and maintenance.
	s. d.	s. d.	s. d.
Granite	12 0	0 2	0 7
Haslingden Rock..	7 0	1 0	1 7
Sand Grit	6 6	1 0	1 9¼

Taking the first cost of granite at 12s. per yard, minus 1s. 6d. for the old material taken up, gives 10s. 6d. per yard, which might be borrowed at 3¾ per cent., and 7 per cent. would in twenty years repay principal and interest; 7 per cent. on 10s. 6d. = 9d., with 2d. for repairs, 11d. per year for twenty years, as against 1s. 7d. in perpetuity for Haslingden rock, and after this the granite would still be in good condition, the whole money repaid, and would last another twenty years, with an extra 2d. per yard per year instead of 1s. 7d. for ever. In forming and paving new streets work had been done in six years to the amount of 46,000*l*.

Mr. Councillor Tuke read a paper in which he compared at some length the cost of various modes of excreta disposal. The cost of what is known as the pail system in Bury was, he calculated, 20s. 6d. per pail per annum. He advocated a trial of the "slop-water carriage system," introduced into Salford some years ago by Mr. Fowler, and which is now also in use in Bristol and Hyde. This was much more economical in working, costing only 3s. per closet, although against the saving effected must be set the extra expense of treating the effluent by some system of sewage purification. The change was also advocated on account of the nuisance caused by the removal of the pails.

In the discussion which followed,

Mr. Fowler said that London in 1832 was visited by a great plague of smallpox. At that time the midden system was in operation, but an Act was passed to do away with that system. It was done promptly, and from that day to this London was the most healthy city in the world. It did not fluctuate in its death-rate like other towns. He strongly condemned the Manchester system, and said they should try to do away with the pestiferous receptacles which were the result of it.

Mr. Allison said that Mr. Fowler in speaking of the midden and privy system and water-carriage system had not given Manchester fair play within 100 per cent. The great danger was from decaying vegetable matter, which was thrown into the ashpits and allowed to accumulate for three, six, or nine months in the large towns.

Mr. Jerram said that they found that the cost of the pail was 20s. 6d. per closet, whereas they knew that a pound a closet would go a long way towards providing a sewerage system in any district they had to deal with. The quantity of sewage collected by the pail system was comparatively small, because there was the greasy water from the slopstones, which, if the Rivers Pollution Act were carried out, would have to be provided for; and why could they not deal with the whole subject at one place? It was, therefore, in his opinion, gratifying to find that the pail system had been a failure: it was indecent and not conducive to health.

Mr. Spencer said that with water-closets the difficulty was how to get rid of the ashes, and they must not suppose that in establishing a water-closet system they had got rid of that difficulty. In many cases the water supply was inadequate and the charges exorbitant, and they must not forget this in estimating the cost of water-closets. As an improvement on the horrible privies he welcomed the water-carriage system as a step in the right direction, but they must guard themselves from jumping to the conclusion that that solved the question. He thought they might have both systems side by side if they had an efficient system of collection.

Mr. Lobley said it was well known that the Rochdale pail system was an expensive one. At Hanley they had adopted Turner and Robertshaw's modification, by which the liquid and solid excreta were separated. The liquid matter by a syphon ran into the sewers. He found there was no objection to that, and the cost of collection was greatly reduced. At Hanley they had gone back to the barbarous system of collecting in nightsoil carts.

Mr. Tuke, having briefly replied on the discussion,

Mr. R. Vawser, C.E., Manchester, one of the engineers to the Tramway Company, read a paper on the tramways. In conclusion, he said: The road and rolling stock on the tramcars will be found to embody the most recent improvements, but the subject of traction power is certainly not yet solved. I have every reason to believe that great advances in the engines will shortly be developed, and, judging from recent experiments, there is every reason to believe that the cars will at no distant day be propelled by electricity.

Preservation of Neville's Cross, near the City of Durham.—The monument which marks the site of the famous battle of Neville's Cross, fought in 1346 by the English army, commanded by Ralph Lord Neville, against the Scots under the command of their king, David, is in a state of dilapidation. A committee, represented by Mr. Edward Castle and Mr. Henry Dodd, assisted by the Rev. William Greenwell and Mr. J. W. Barnes, has undertaken to raise a fund for the purpose of preserving and protecting all that remains of this interesting memorial.

THE PROPOSED NEW ADMIRALTY AND WAR-OFFICE.

CONDITIONS OF COMPETITION.

A DEPARTMENTAL paper was issued on Monday last from the Office of Works, with reference to the proposed competition of architects for the Admiralty and War Office, and containing instructions and conditions, a schedule of the accommodation required, and plan of the site for the new buildings.*

The following paragraphs are extracted from the "Instructions and Conditions" :—

There will be two competitions, the first to consist of sketch designs, open to all, and the second or final one to be conducted as hereinafter described.

Before any designs are sent in, the Commissioners will appoint a committee of judges, one at least of whom will be an architect. The judges so to be appointed will select ten designs, or such less number as they may think fit, the authors of which will be invited to compete in the second or final competition.

In order to obviate the possibility of the sketch designs lodged in the first competition being made use of by the competitors who may be invited to enter into the final competition, such sketch designs will not be allowed to be seen by any one except the judges and their officers, by whom they will be returned direct to their respective authors.

In the first competition the designs of the competitors must be exhibited by sketch plans, elevations, and sections, to a scale of 24 ft. to the inch, and must consist of a plan of each floor, an elevation of each of the principal fronts and courts, and at least two complete sections from north to south, and one from east to west.

Each design is to be accompanied by a description of the accommodation (stating the areas) provided on each floor for each department and sub-department; the total cubic contents of each of the two buildings measured from an assumed level of 10 ft. below the basement-floor line up to halfway between the wall-plate and the ridge of the roof; an explanation of the material and mode of construction proposed to be adopted; and an approximate estimate of the cost of each building.

The authors of the designs selected by the judges will be invited to enter into the second competition, for which supplementary conditions will be issued. Those conditions will be in general accordance with the above so far as applicable, but may contain such additions or alterations as shall be deemed necessary by the Commissioners of Works.

In the second competition each of the selected competitors will be required to send in plans, elevations, and sections to a scale of 16 ft. to the inch, together with a perspective view. The competitor shall be at liberty to make such reasonable modifications of his sketch design as he may think expedient. Each selected competitor shall be paid the sum of 600*l.* towards his expenses, provided he shall comply with all the conditions to be hereafter prescribed for the second competition. The whole of the drawings and papers thus sent in shall become the property of the Commissioners.

The selection of the architect to carry out the work will be made from the competitors in the second competition, subject to the approval of Parliament.

Each design in the first competition must have a device or motto marked on each drawing, and be accompanied by a sealed letter bearing the same device or motto addressed to the judges, giving the name and address of the author, which shall only be opened after the selection mentioned in paragraph 3 of the Conditions shall have been made.

The designs in the first competition are to be addressed to the judges, but delivered at the expense of the several competitors, and before twelve o'clock noon, on the 1st day of March, 1884, into the custody of the Clerk of the Works, Houses of Parliament, at the St. Stephen's Porch entrance in Abingdon-street, who will also take charge of the sealed letters. Any design which may arrive after that time will be set aside.

The designs of unsuccessful competitors in the first competition will be returned to them at the expense of the Commissioners. The selected designs will be similarly returned to their authors for the purpose of preparing the drawings in the second competition.

The remuneration of the architect will be 25,000*l.* for the entire work, including the sum of 600*l.* to be paid to him for his competition drawings, and the services to be rendered in consideration thereof shall include all those usually performed by an architect, except that he shall be relieved of all expense, trouble, and responsibility involved in determining the times and amounts of instalments to the builders, and in making up the accounts connected with the execution of the works, which will be provided for by the Commissioners of Works.

The buildings will be erected in blocks, at such intervals as may be determined by Parliament, and a proportionate part of the architect's remuneration for the entire work will be assigned to each block from time to time by the Commissioners of Works. One-third of the sum so fixed for each block shall be paid to the architect immediately after a contract with a builder for the execution of the works shall have been entered into; one other third part of the same sum shall be paid to the architect as soon as one half the contract sum shall be paid to the builder; and the remaining one-third part of the said sum shall be paid to the architect after the completion of each block.

The plans, drawings, specifications, and other documents relating to the works, whether actually referred to in the contract or not, shall be the property of the Commissioners, and shall be deposited at the Office of Works; and the architect must, at his own expense, make all tracings and copies of plans, drawings, and other documents which may be necessary for the conduct of the works.

Any dispute or question between the architect and the Commissioners shall be referred to an arbitrator to be appointed by the Treasury, who shall have such powers and authority as the Treasury shall think fit to give him, in addition to the ordinary powers of an arbitrator.

No rules of any association or society shall be held binding upon the Commissioners in reference to the works or matters herein referred to.

* A block plan of the site of the proposed buildings, according to the official scheme, was given in the *Builder* more than a year ago, viz., on July 8, 1882. But the "proposed official residence," the site of which was shown stretching across the triangular space on the right hand as one enters the Mall from Charing-cross by Drummond's Bank, is not now shown on the block plan accompanying the "conditions," although the triangular space in question, as well as a considerable area *south* of the Horse Guards (including, apparently Dover House and the buildings in the rear of Downing-street and the Treasury Offices) are indicated as available for "possible future extensions."

RAILWAY PIONEERING IN THE UNITED STATES.

IN our last number we gave a brief abstract of the length, cost, and traffic of the railways of the United States, the construction of which is now proceeding at the rate of very nearly a thousand miles per month. On the very day on which this was published an addition was made to the great total by the completion of the Northern Pacific Railway, with a mileage of 1,980 miles of main line, and an aggregate length of 2,654 miles of main line and branches together. This line is the third great railway across the American continent, and claims to be the longest railway in the world, running across thirty degrees of longitude, and opening a belt of territory 2,000 miles long and 400 miles wide. Extending from Lake Superior to Pugat Sound, it flanks for its whole length the southern boundary of the British possessions. For the first 150 miles of its course from the head of Lake Superior, it passes through an almost unbroken forest. It then enters the rich agricultural region of Western Minnesota, and runs through a prairie of from 60 to 80 miles wide, forming an area of 66,000 square miles, the greater part of which is fertile wheat-growing land. It then runs for nearly 300 miles through Dakota, a district containing 153,000 square miles, the active development of which may be estimated from the fact that its population has risen from 14,000 in 1870 to 325,000 in 1882. The average wheat yield of this district is 20 bushels per acre; 25 bushels per acre is not unusual, and the total yield, which in 1880 was 3,000,000 bushels, rose to 12,000,000 bushels in 1882. The territory of Montana is next passed, containing much grazing land, as well as a great silver and copper mining district, of which the yield is exceeded only by that of California. From Montana the line runs through the forests and prairies of Idaho, and traversing Washington territory, enters Oregon near its north-eastern corner. The western part of Oregon is covered with a dense forest of fir, coming down to the edge of the waters of Pugat Sound, which cover an area of 2,000 square miles, accessible for vessels of the heaviest tonnage, and dotted with numerous islands.

The gradients of the line are considered favourable for America, being generally not more than 52 ft. per mile, or about 1 in 100,—a ruling grade on the Metropolitan Railway. But a summit elevation of 5,565 ft. is reached in the Belt Mountains, where there is a tunnel 1,200 yards long. The altitude attained in the Rocky Mountains is 3,925 ft.; and there is a tunnel 1,280 yards long there. The ruling gradient in this district is 116 ft. per mile, or 1 in 46. This is a serious lift to surmount; as it allows of the traction of only one-fifth of the load that an equal power would propel on a level line. But the function of the railway in such districts is that of the pioneer, and the comparison of the advantages that it yields is to be made, not with the railways of the Old World, but with the corduroy roads and uncleared forest tracks of the New. Hardly a train will run over the newly-laid line that will not be freighted by settlers and their belongings. There is a limit, if it be not yet distinctly ascertained, at which the railway carriage of wheat becomes commercially impossible, and the waterborne wheat of the upper part of the Ganges Valley is now driving the American supply from our market. But as an instance of the rapid transformation of the face of nature by the labour and the migration of man, it is doubtful whether the world can now show a parallel to the Northern Pacific Railway district.

THE NEW RAILWAY STATION AT STRASBURG.

THIS structure (recently completed) forms an imposing architectural feature of the city, while its general arrangements tend to facilitate the conduct of the traffic which centres at that spot. The German press speaks of it as being the most extensive building of its kind within the Empire, and approval is expressed of the arrangement by means of which the ticket and other offices are on a lower floor, while the upper portion contains the waiting and refreshment rooms, as well as the railway lines. This form of construction is spoken of as differing from that which is usual in Germany, and is doubtless to some extent connected with an important alteration made, by means of which Strasburg ceases to be a *cul-de-sac* station, the trains passing through it. Two tunnels underneath the platforms allow of the passage of arriving and departing passengers from one part of the station to another. Separate waiting-rooms are also provided for these two groups of passengers.

The station is situated between the White Tower Gate and the Stone Gate, in immediate proximity to the city walls. The front of the building is monumental in character, and has two side-wings. The material used is sandstone with granite basement. Above the front windows of the central portion, facing towards the city, runs an architrave on which the arms of Germany and Alsace-Lorraine are represented with appropriate ornamentation. The façade is crowned by a large dial surrounded by two artistically sculptured reliefs intended to represent the two annexed provinces. The large vestibule contains two colossal figures of Agriculture and Industry, as well as two important oil-paintings on gold ground, which are intended to record contrasting scenes in the history of Alsace. One is the solemn transporting of the imperial jewels to Hagenau by Barbarossa in 1168, and the other the reception of the Emperor of Germany in 1877.*

The steam water-heating system is applied to all the rooms in the station. Electric illumination is used in the building and its surroundings. The cost is stated to be about 760,000*l.* and the entire work is said to have been carried out upon a scale commensurate with the importance of Strasburg as a centre of traffic, and with due regard to its further development.

Burnham Beeches. — The dedication of Burnham Beeches to the public use will take place on Wednesday, October 3, the ceremony being performed by the Duke of Buckingham and Chandos, Lord Lieutenant of Bucks.

* See *Builder*, vol. xliv., p. 411 (March 31, 1883).

SAXON ARCHITECTURE.

WE want an exact definition of style for Saxon architecture.

It appears that the Saxons, as they arrived in Britain, were wood-builders; even after their conversion the illuminations to early missals represent a quaint curvature of structural outline inconsistent with stonework,—similar, however, to the wooden survivals of Norway, Switzerland, and Kashmir.

Greenstead, near Epping, has a wooden church that has been enlarged; it is, however, of very late Saxon date, say 1013 A.D., but some earlier churches in stone, ascribed to Saxon times, are mimetic of wooden architecture. In childhood I was told that all pre-Gothic architecture was Saxon, but I now find that these solid castles and cathedrals are called Norman, going on to Early English and Perpendicular. The Romans in Britain were stone-builders, as the remains at Lympne, Richborough, Reculvers, and numerous other places clearly show; countless millions of red tiles were made in Britain, partly by the legionary soldiers, as numerous inscriptions amply prove, but chiefly by the mixed population of Romanised Britons and Celto-Romans of various nationalities, who sprang from the military colonists, *i.e.*, discharged soldiers who ended their lives here as cultivators, landowners, manorial squires. Their children, however, would owe military service and might be drafted abroad; still the main strength of the second, ninth, and twentieth legions must have been Roman citizens of British extraction long settled in the province.

Among this mixed population must have been thousands of stonemasons who, and as I conceive, more especially in specific localities, might continue the practice of brick-making, with a knowledge of stone construction, after the Imperial exodus, the tile latterly gaining in thickness and losing in symmetry as time passed. The undisputed sites of Roman defensive architecture hardly prepare us for the fully developed Norman castle, the stride is too rapid. Pevensey and Portchester, undoubted Roman foundations, have been converted by the Normans; I do not suppose that the Saxons dealt at all with these two structures.

Some favoured townships escaped devastation, admitting Teutonic citizens to a Celto-Roman municipality; such, however, were the towns that survived to suffer most at the subsequent Danish invasions. During the interval there would have been artisans at work on tiling and masonry. Chichester is a city with equivocal records; a Roman settlement fully peopled, taken by Ella and occupied by Cissa, it appears to have resumed its continuity at once. The Saxons were not then town-settlers as a body, but had to scatter and progress; those who did settle at Chichester would need the help and labour of natives to keep things going. I use the word "equivocal" because much of its early history is in dispute. Colchester is a more typical instance; Angles or Saxons were there very early mingled with the Celto-Romans, whom they superseded, not by displacement but by survival, and it appears to have preserved its continuity during the Danish troubles. St. Alban's in its history resembles Salisbury, for the town of Verulam was rather deserted than destroyed, the removal of the clerics to a short distance being followed by a general exodus of the surviving population. By far the most remarkable structure in England is St. Alban's Cathedral, where square tiles are built up into lofty piers and solid walls; it is probably a fair estimate to allot nine millions of tiles for this purpose,—a prodigality unknown to the Romans. The legend recites that the later Saxon abbots, conscious of the decay of their building (dating from 793 A.D. and inferentially of stone), did, for several generations, accumulate building material and hoard treasure for a contemplated reconstruction. It is said that the tiles were collected from the adjoining ruins of Verulam. The treasure, however, vanished in bad times, but the tiles remained, and, as is alleged, were so utilised by Normans. I doubt the power of collecting a sufficiency, considering the well-known tenacity of Roman cement, but think it more probable they were partly made to order on the principle of a surviving art. I have examined many specimens of this local tile, and think it all late, very late.

Let that pass. We know how many battles have been, and still are being, fought about the history of Colchester Castle; it cannot be called Roman, it is not purely Norman; it has numerous Roman tiles shown in herring-bone fashion and other forms. Colchester is certainly one of those places where Celto-Roman merged into Saxon without a revolution; the subsequent Danish inroad was more violent. We have Roman work in the Tower of London with a Norman superstructure. Was there no intermediary period of style?

There are, it is said, Roman tiles placed herring-bone fashion in Guildford Castle, among many other sites; yet, when Alfred's daughter, the saintly Ethelfled, found it desirable to drive a line of forts round the Mercian frontier, A.D. 913, she resorted to earthen mounds with wooden palisades,—a form of defensive architecture ascribed, on high authority, to the Norman barons prior to their settlement in England. Of Ethelfled's castles, that most interesting structure adjoining Stafford is a good illustration; but her palisades have been superseded by later stonework. Conisborough Castle is awfully disputatious; its structural peculiarities so closely resemble the burghs or brochs of Shetland and North Scotland, with cellular walls; here the prefix Conan is purely Celtic, a name diverted to kœnig by subsequent Teutons. The earliest Norman castles in England show the mound raised artificially where a rock or hill was wanting, as at Oxford, Cambridge, Farnham, &c.

The claim of Saxons to the construction of stone castles has never been fully admitted; what, then, can we say further of Corfe Castle? Yet, in appending a caster, ceaster, or chester to the Celto-Roman town name, as at Wroxeter, Silchester, and many other places, they evidence a full knowledge of the existence of the solid stone walls we now see in ruins. I single out these two because the desolation is so very apparent, the remains so conspicuous and without any apparent traces of Saxon occupation, yet with names of Saxon application. Another case in point is Grantchester, near Cambridge, which Bede, writing of A.D. 660, calls "a small abandoned city . . . . with walls." There are now no traces of stone-walling in the village, but it is named from the equivalent for castrum, and the name remains. I suppose that in 660 there was still a small resident population as at present. In like manner, the Celto-Roman Londinium became Londenceaster, and by abridgment plain London; the affix ceaster, it is therefore plainly seen, means a walled town, not the structure we now call a castle. There is another equivalent word more purely Saxon which may be thus illustrated: Bamborough, which has a fine old ruin, called part Norman, part Roman; can any one trace real Saxon work in this structure? Scarborough, with a Norman castle; Flamborough, named from a supposed Roman pharos. Brough, beorg, bury, burgh, and borough are the "berg" of Norway, the "beorh" of Beowulf, and the "poor" or "puri" of so many Eastern place-names. Several in England with these terminations have conspicuous Roman remains.

Whitby has no remains of a castle,—the old Abbey was, no doubt, strongly fortified; the terminal "by" is Anglian, and related to "burgh" in a civil sense.

Ireby, in Cumberland, is a supposed Roman site; Lazenby has Roman remains; also Middleby, in Dumfriesshire; so have Overbie and Netherby. "By" may therefore be regarded as a linguistic equivalent to *castrum*.

II.

Turning to the churches, some writers advocate a revival, effected in part by introducing foreign workmen, a statement supported to some extent by the Chroniclers. In this sense is explained the rise of York Minster,* A.D. 627; Lincoln,* 633; Southwell,* Ripon,* Hexham,* with crypt built of Roman material; Bishopwearmouth, A.D. 674; Jarrow,* 684, with so-called Saxon pillars; Abingdon, 675; York rebuilt, 767; St. Frideswide's, Oxford, 730; Ramsay, Hunts, rebuilt, 974; Repton, 660, crypt called part Saxon, part Norman; Barton-on-Humber*; Romsey,* Hants; Brixworth,* Northamptonshire, with Roman tiles; Earl's Barton,* striped stonework to imitate timber; Barnack; Bury St. Edmunds,* 925, 1010; Saxon gateway; Westminster,* rebuilt 1065, Pyx office and gymnasium, called Saxon; Sompting, gabled tower; Bartlow, round tower; St. Michael's, Oxford, Saxon tower; St. Peter's,* Cambridge, Roman tile; St. Benet's, Cambridge, Saxon tower; Canterbury St. Martin's,* 597, Roman tile; Canterbury St. Mildred's, Roman material; Canterbury, St. Pancras, Roman wall, a supposed basilica; St. Botolph's, Colchester, Roman tile used structurally in large proportions, called Norman work of 1116.

The asterisks, so freely used, indicate Roman pre-occupation and an assumed pre-Augustine Christianity.

Putting all things together we ought to accept the conclusion that stone architecture did survive the Roman exodus in certain localities.

It is not clearly shown why Normans, 600 years after the Romans were forgotten, should seek out Roman tile when they could get Purbeck marble and Caen stone; but I can quite understand why local Celts, if Teutonised, should do so. Then there are the crosses,—what was a Saxon cross? Only a survival of the Celtic monolith. At many places in the North of England we find Celtic crosses with Runic inscriptions, yet figured with Christian emblems: to some extent they are bi-cultic, *i.e.*, they represent a compromise or combination of Pagan and Christian characteristics effected prior to the full conversion of the invading Pagans. The workmen who sculptured such monoliths would be at hand to work on an elaborate gateway or the head of a doorway, in stone, and to make fonts; the earliest appear to have been adapted from some Roman material or utensil found to hand, and there are curious old fonts about, with so-called Celtic ornamentation in the same style as the Irish illuminations,—a style again reproduced in enamels, as in the Alfred jewel in the Ashmolean Museum at Oxford, a survival of Celto-Roman art in Britain.

The choice of such places as the asterisked sites named above for the early reconstruction of churches is perfectly natural, and only the restoration of what, perhaps, was not quite extinct, maintained with difficulty by the hitherto untonsured clergy of pre-Augustine England.

The chief characteristic of Saxon church architecture appears to be the tower, with long and short work to the quoins, a supposed imitation of buildings with wooden logs; something also in the lights; a very rudimentary window of two stones mutually inclining, and the later window of two arched openings, with central pilaster. The larger buildings and some castles show round arches and groined roofs; the round arch is purely Roman, and was adopted in all the provinces. Such solid crypts, as at Corfe Castle, may survive many upper structures, and the round arch remained in use with the Normans till an accidental bisection introduced the pointed arch.

We frequently read of Saxon pillars. There are curious banded pillars at St. Alban's, preserved, no doubt, from a former shrine of the local saint; then there is the bulgy pillar, with a swelling or so-called entasis: this is of Roman origin.

Much of all these styles is pre-Norman. Will any competent body of authorities draw up a final standard of style for Saxon architecture?

A. H.

RESTORATIONS AT THE GOVERNMENT OFFICES.

ALTHOUGH they were only erected within a comparatively recent period, the refacing of the Government offices in Whitehall has become necessary, and preparations for carrying out the works have just been commenced. The buildings extend from Downing-street in the direction of the Horse Guards, and are at present occupied by the Educational, Privy Council, and Treasury departments. Recently it has been discovered that the stonework of the frontage in Whitehall, more especially the main cornice and the carved work immediately underneath it, has been undergoing a process of decay, and is no longer safe. Within the last few days heavy scaffolding has been in course of erection in front of the building, which is intended to be carried the entire length, for the purpose of facilitating the execution of the necessary work, which will occupy a considerable time, and which it is stated will involve an outlay of more than 8,000*l*. Messrs. Mowlem & Co. are the contractors.

The Spire of St. John's Church, Notting Hill, has been found to be so unsafe that it is being removed.

DOMESTIC ARCHITECTURE IN SOMERSET.

AT YEOVIL AND ROUND ABOUT.

IN a previous notice of this year's excursion of the Architectural Association (p. 349, *ante*),* it was stated that further illustrations of the buildings visited would be given. A large number of the well-reasoned conclusions, and, of course, many fancies and freaks, would be found recorded in the sketch-books of the party of between thirty and forty active sketchers, who glanced keenly, albeit rapidly, at this south-east corner of Somerset and the bit of Dorset adjoining; and these studies of the works of our forerunners in the arts would fill a good many plates, and afford plenty of matter for reflections and comparisons. We have made up two plates: one containing four roofs,—two spans, differently treated; a lean-to, which has much painted decoration; and the Cerne Abbas roof, which comes in as a barn-roof and to illustrate a fourth form. For the other plate, several panelled rooms of sufficiently distinctive types have been selected, to show different ways of finishing the interiors of houses.

The relation of towers to the structures to which they are attached, and the design of the towers themselves, have served as the text for some remarks; but there are so many other things, besides the expression of the exteriors of the buildings, which a sense of proportion would lead one not to pass by without notice. Among the church interiors, for instance, the wide nave of Yeovil without a clearstory, but with a tall arcade and great aisle windows, might be pitted against Martock,—which has a remarkable clearstory, as well as many other admirable features. But such comparisons, and such subjects as grouping, light and shade, adaptation to site, proportion, and history, seem to offer much too wide a field for the few words which can be interposed before coming to the text for the illustrations. We therefore prefer to turn from the larger considerations to minor matters, such as rood and other screens, seats, desks, pulpits, panellings, fonts, monuments, tiles, hagioscopes, &c., and to be satisfied with grouping some of a sort together.

The rood-screens at Trent and Queen's Camel, two parishes about four miles apart, are similar in some respects. They are both in fair condition, spread out at the top after the manner of fan tracery, with larger traceried panels above, and plainer lower panels. That at Trent is, however, much the better of the two,—better proportioned and finer in detail. The screen which was under the chancel arch, in the grand church of Martock, is said to ornament several gentlemen's houses in the neighbourhood. The screen in the tower arch at Huish, removed from Enmore Church when both churches were undergoing restoration, would deserve notice on its own account; and as leading to the mention of the handsome and admirably-preserved Norman south door, which is only a few steps away from it. There is not much Norman work such as this in the neighbourhood. The red colour is considered another instance of the admirable effect to be obtained by scorching Ham Hill stone. The seating at Yetminster, some plainly moulded and some with buttresses, is all thoroughly good and suitable. At Stoke-sub-Hamdon the old seats are much richer and more varied as well; there are also old seats at Somerton; those at Trent are rude in character. The most noteworthy pulpits were put up in the first half of the seventeenth century. There is one at Stoke, and another at Brympton: that at Somerton is dated 1615,—it is not improved by the too vigorous colouring put upon it. The table at Somerton is dated 1626, and the walls of the chancel are lined to some height with good wood panelling of about the same date. The pulpit at Huish is dated 1625; that at Bradford Abbas, dated 1632, has a sounding-board; and that at Cerne Abbas, which resembles it in many respects, is dated 1640, but has none. The carving of the Mildmay pew at Queen's Camel is of Jacobean character. Near to it is the memorial to the Mildmay who was wounded at Newbury fight, and died 1690: the house of the St. John Mildmays is about a mile to the north of the village. Yetminster has some carved wood panelling of the same date,—very little of it, but superior in its kind.

The font at Queen's Camel is of an unusual form, and that at Bradford Abbas, though not identical, resembles it strikingly. There are four detached panelled piers at the angles, each 6 in. square, and figures in the niches over them which are joined on to the font. The font at Yetminster is attached to the pier it adjoins, and having the same base mouldings, it seems pretty clearly to be in its original position. The fonts at Huish and Langport are much like one another; that at Hinton St. George is composed of parts of several dates, including Transitional. At the same church the very noteworthy collection of Poulet monuments should tempt every visitor there who has reached Crewkerne. The Daubeny monuments in the south transept of South Petherton and the fine brasses there, one a really magnificent double brass; the Strangewaies effigies at Melbury Sampford; the Elizabethan monument in the chancel of Stoke-sub-Hamdon, are a few others which make a strong impression on the memory. In the room over the vaulted gateway at Cerne Abbas, forming the flooring of the bay-window, are a number of tiles from the abbey and its buildings. Muchelney is wonderfully rich in fine tiles, as those readers know who call to mind Mr. Shelmerdine's drawings given in the *Builder*, Sept. 27, 1879, p. 1,075. At Cerne Abbas there is a brass chandelier with many burners, bulbs, and twisted arms, and a good deal of character. Brympton has two, each with two tiers of lights. Somerton has three large ones of later date (1786), which also deserve notice. This brass-work is of the kind which has furnished models for some useful modern work, free from so-called ornament, the ornament being found in the pleasing form alone. As being good brass-work, the stately sixteenth-century lectern at Yeovil should also be named.

Hagioscopes naturally have the look of being afterthoughts, or of being but poorly thought about at the best. There is a neat modern one in the much, but well, restored south transept at Brympton,—the transept with a beautiful window. Canted corners and well-proportioned narrow archways, throwing open the chancel to the transept, would have done what was wanted more neatly than the tunnels,—rather like badly-shaped drains, scooped through walls and shafts at Stoke-sub-Hamdon. That from the south transept must be about 8 ft. long. Of course such archings would have involved considerable reconstruction. The church is situated under the slopes leading up the Hamdon Hill,—now furnishing the beautiful Hamhill stone so largely used for at least a dozen miles round the quarry,—which had on the top a British camp about three miles round that the Romans took to. There is in Stoke Church work of all dates, from the very earliest Norman to Jacobean; there is, indeed, later work than that, for it has been carefully restored by Mr. Ferrey, who has dealt with many churches in Somersetshire. Huish Episcopi has a remarkable hagioscope in the south pier, and at Langport there is one in the north pier of the chancel arch. The "Hanging Chapel," — a little Perpendicular building standing on an arch which spans the road just by Langport Church,—is now used as a Quekett Museum, for Quekett, the microscopist, was educated in it when it was used as a school. Local tradition is not certain whether there were executions after the defeat of Lord Goring at Langport in 1645, after which Charles's people gave up struggling in Somerset, or whether the chapel got its name in the grim days after Sedgemoor forty years later, or whether it is not merely an agreeable reminder that all the walls of the ivy-clad chapel do not start from the ground.

Among the roofs over church naves near about Yeovil, the splendid roof of Martock would take the first place, as, indeed, would the church itself in most respects. In this roof the spaces above the tie-beams are filled in with rich tracery; the whole of the surface of the roof between the principals and the intermediates is panelled; the king-posts and the intermediates have good angels at the ends of them; under each principal is a large corbel, and the line of support is carried down by columns and angels to the spandrels of the arcades. The cornice is of great size and appropriately enriched; there are carved bosses at the intersections and large pendants to the intermediates;—and all in sound condition, for the church has been thoroughly repaired. The nave-roof at Somerton would probably deserve the next place: it has frequent principals, is richly panelled, and has large carved bosses. A grotesque monster, very vigorously executed, occupies the space on the side of each king-post,—making altogether a very individual roof. Tennis-balls were found in it, and sent to the Taunton Museum, and prisoners from Sedgemoor have been credited with playing at tennis in the church. A fringing,—an ornament like screen-brattishing turned upside down,—occurs along the lower edges of the tie-beams; a similar decoration appears in a similar position in the rood-loft at Queen's Camel. The roof over the nave at Queen's Camel, which we illustrate, is a very good specimen of the same kind of roof as those at Martock and Somerton, with tie-beams and brackets under them, strong principals, panelling by the purlins, columns as king-posts, brackets from them to a moulded ridge;—and rich and appropriate decoration throughout. The sub-divisions of the ceiling unfortunately only exist now in the bay next to the chancel arch. Decay has set in, parts are being lost, and the whole will soon be endangered.

The roof over the chancel at Queen's Camel is a fair example of the cradle form of roof. Many readers will call to mind the wonderful roof in an arched form over the nave at Shepton Malet, about nine miles on the east of Wells. There are, it is said, 350 panels in it, all differing in design. At Martock, the wealth of design in the panels should also be noted. There must be this sort of fertility,—the evidence of a power of doing a large number of things admirably,—if a piece of architecture is to give more than a temperate satisfaction; and Martock gives more. The chancel roof at Queen's Camel cannot, indeed, vie with Shepton Malet, but it is a meritorious work. Mr. Cole A. Adams, the president of the Association, gave the roof credit for many good points,—in the course of one of the pleasant little addresses which he delivered outside the buildings visited,—assisting the members in a few words to the results of much previous study on the spot. In the porch at Queen's Camel attention was called to "the extraordinary variety in the bosses, the skill displayed in the carving of them, and the clever treatment of figures and draperies in the angels at the feet of the principals,—all points worthy of careful study." The chancel is treated similarly for the whole length, which is divided into six panels.

The nave of Bradford Abbas is covered by a roof which is panelled, as some of the other roofs mentioned already, and as others to be mentioned; there are, however, happily, few instances of such careful decoration upon such unsatisfactory construction. The principals simply lean against each other, and had no tie or brace of any kind, till some iron collar-ties were put in recent times. Mr. Carpenter would have done much more eighteen years ago if he had been permitted, and things must have been getting worse in the interval. The beauty of the angels and of the few bosses which remain may be noted; and that the painted angels, which carried painted and gilded coats of arms, were grained and varnished by the rector's orders. The roof over the south chapel at this church,—of course, and fortunately,—differs in type from that over the nave; the easternmost bay is more richly panelled than the rest, and there are remains of colour decoration. The external doorway of the chapel is original in form,—a gabled stone-covered projection. There are thus two notable doorways to the church,—the west door has been previously described. Near the west end is a large churchyard cross; of its original form a good idea can be obtained,—there still remain parts richly sculptured with figures. The stone screen to the south chapel is ancient, though somewhat modernised: formerly it carried a solid wall, as in the church at Thornford, the village halfway between Bradford and Lillington Hill,—the wooded headland which replies on the south side of the Yeo to Babylon Hill on the north. The hill does good duty in the landscape seen from the central tower of Sherborne,—part of the rich "garden of England,"—one of the happy valleys of the "Felix" division of Dorset. Among stone screens, that now moved to the east side of the tower at Stoke-sub-Hamdon should not be forgotten, nor that under the chancel arch at Brympton; the first of these has much character, but was harshly treated at some time.

In classing span roofs the nave of Yetminster would go with the Abbot's Hall, now the nave of the chapel of Sherborne Grammar School, and

* For notice of Sherborne Abbey Church, see p. 208.

with that of the Guesten Hall, now the School Library, as they all have curved ribs to their rafters finishing below collar-beams. At Yetminster the ribs are about 18 in. from centre to centre, there being a curved rib to every rafter; in the others there are four or five common rafters between each pair of principals. None of these roofs are of much size, but they are all very pleasing examples; and the same may be said of the roof of the hall on the opposite side of the road from the church at Martock,—now a cooper's store and workshop. The two tiers of curved braces to the purlins at the Guesten Hall and the four tiers at Martock may be compared, to the advantage of the latter elegant variety. The roofs of the hall and chapel at Lytes Cary would go into the same class,—only it seems a duty to give them and the house to which they belong a separate mention. The house is a rarity,—being a good residence, built in the first half of the sixteenth century, which has not been thoroughly inhabited recently enough to be much altered, and has not been wilfully injured to any great extent. Thus, if the dirt and dust were removed, and the holes in the floors mended, it might be possible (by making believe a good deal) to imagine it ready for a new tenant,—under covenant to put the place in repair,—entering into possession in the early years of the seventeenth century. It must be fully six miles from a railway, being situated in a happy trapezium of a goodly size, into which the shriek of the steam-whistle only penetrates from the margin. It is, however, not half a mile from the Fosse Way, the remarkable Roman road which ran from the Humber into Devonshire. Between Cirencester and Bath the old road is now almost disused. Except for about three miles on the north of Shepton Malet, where a new piece of road supersedes the old one, it is still the road from Bath to that town. Between Shepton Malet and Ilchester there has probably been no important change, and the old road crosses the river Cary at Popple Bridge, not far from Lytes Cary, where it did sixteen centuries ago. North and south of Ilchester the road is about as straight as a line ruled on the map. The Cary takes a bold bend at the Fosse Way, and runs along the narrow valley on the east of Kingsden Hill,—the hill of the great prospect to east, south, and west,—on its way to Sedgemoor, the Parrett, and Bridgwater Bay.

The Lytes, of Lytes Cary, built the house, putting arms and the date 1533 on the fine bay window in the centre of the south front, and seem to have practised the art of being country gentlemen steadily for many generations. Henry Lyte was something more, for he published in 1578 one of the earliest works on scientific botany put forth in England, and he formed a botanic garden at Lytes Cary. Thomas Lyte, who was buried in 1638, was the sixteenth of the family in recorded lineal descent. The roof of the hall, a very perfect work, has well-moulded principals, ribs starting from angels bearing shields; plate, upper plate, and tracery between them; three sets of curved and cusped traces to the purlins. The hall has been shortened at the north end to make a passage to the modern residence, which has been added to the north side of the hall. The old house is only used for storage, but it might be converted to more dangerous uses. Cider-presses and rough work in the old rooms may be threatened any day, and would soon work damage at a different rate from the neglect, not wholly unkindly, which has long been their portion. The chapel probably belonged to a house which was pulled down, before that finished as far as the parapet in 1533 was commenced. It is of the Decorated period, and has a little doorway, a three-light east window, and two two-light windows with square heads in the side walls. The architects of that date believed in square heads, well filled with tracery, when limited height made them desirable. The chapel is about 11 ft. wide, and small every way to match. It has round the walls, under the plates inside, a row of shields with armorial bearings in colours.

The roof over the chapel at Lytes Cary is an example of ribs to principals and collars on a very small scale, but that over the great barn at Cerne Abbas is an example of the same construction with a span of a little over 30 ft. The barn has four bays on each side of the transepts, the principals being 12 ft. 6 in. from centre to centre, about the favourite distance. In the transepts are the large gateways. The level-bedded ashlar of the fine buttresses is continued through to the inside face of the wall. As the filling-in between the ashlar is of split and squared flints, built in level courses both inside and out, the buttresses are treated to quoins returning from the internal angles. The barn may be classed in many respects with such great barns as Doulting, Pilton, Preston, and Glastonbury. The flints, however, give it a special expression. Naturally in this chalk country the flints are largely used. In part of the monastic building still remaining two courses of split, but not squared, flints (5 in. or 6 in. for the two courses) are alternated with one course of rubble (3½ in. to 5 in.), an extremely effective walling in buildings of comparatively small size. The splendid gate-house is of Hamhill stone; the vault of the gateway should, by the bye, have attention speedily. A number of the buildings seem to have been destroyed about 1740.

The main idea of the roof over the north aisle at Yetminster,—illustrated in this number,—is not rare outside Somerset and Dorset. The principals are about 12 ft. from centre to centre, and each has an arched rib coming down on a moulded cap, with a shaft under it which runs down to the floor; the intermediate principals have no brackets. There are four common rafters in each space, and these, as well as the other timbers, are decorated with six colours cleverly applied. The effect at the present time is rich and sober; seen with our eyes in the early days, it would certainly have seemed harsh and "loud,"—unlike the modern work by Mr. Crace at Sherborne, just by. Yetminster was associated with Sherborne, and in the fifteenth century, when its nave, aisle, and tower were rebuilt, the builders of the chapelry of Allhallows were probably employed. At Allhallows only the side walls and respond piers now remain, but the columns, bases, caps, and the wall shafts, which take the ribs of the aisle roofs, are similar; it would, perhaps, be fair to conclude that the aisle roofs had resemblances too. The church is oppressed by three ugly galleries, and a lot of pewing of much meanness. In 1870 it was proposed to remove the eyesores, and do a little more, but the church is still wholly unrestored. Crosses enclosed in circles are carved on the fronts of some of the buttresses, and on the jamb of the south window of the chancel; crosses of the same kind were found also in the adjoining church of Thornford. The north aisle roof at Queen's Camel is not so elaborate as that at Yetminster, and there are no visible common rafters. The painted decoration is in blue and black, red and white, with white fillets, gilt bosses with red in the undercuttings. At Somerton the roof over the north aisle is also similar, but there are, among other variations, no wall shafts. This roof has visible rafters,—well-moulded timbers, and everything in accordance; it is thus enabled to play up well to the fine nave roof.

Roofs must not beguile us further. The panelling from Trent is a piece of rich work in oak, with much delicacy in the details, now on the walls of the hall of the manor-house. The house has been added to a good deal, the old parts remodelled and made into and fitted up as a good modern residence. Many visitors go to the house to peer into the hiding-place into which Charles II. was put when the house was being searched. He was concealed in the house for more than a fortnight. The hiding-place is a dark space between a ceiling and the floor over, apparently constructed intentionally, not high enough for standing upright. It was evidently a good place for concealment from enemies not too intelligent nor too much in earnest. A loose board lifted from the joists gave access to the space. Nowadays a separate stair from the garden to the landing is used by visitors, so that the surroundings are not what they were. Charles made his unsuccessful attempt to escape from Lyme under the guidance of Colonel Wyndham, his host at Trent Manor, who was rewarded for this and for services in the field, with a baronetcy and a pension.

The panelling from Lytes Cary is in the ground-story room on the south front, and is a carefully designed and very complete piece of work. The room is not a large one, and only 10 ft. in height; the details are consequently small. The cornice is about 4 in. deep, and the bottom of the plinth of the pilaster 1 ft. 9 in. above the floor. The "die" under a projected column resembled, and consequently got its name, from the die used in gambling. The die in architecture (dado in Southern languages) soon ceased to be necessarily a cube; between the base and surbase mouldings there was a space, and that became a dado anywhere. This article of faith,—strange sacred emblem, the theme of joyful hymns by the elect,—is thus a kind of survival. The fireplace is a good piece of work of its date, albeit tenuity is carried to an extreme at the bottoms of the pilasters. There is some oak panelling, apparently of earlier date, in the upper room.

The room at Barrington Court has neat panelling, of later date than the work at Trent and Lytes Cary. There the dado is seen in a purely modern form, there being no pilasters. The room is about 12 ft. by 13 ft. At Barrington there are some other pieces of decorative work, but not what might be looked for, considering the size of the house and the admirable design of its exterior. In its external aspect it is now much as it ought to be,—the look of ordinary practical use without state suits it and us well. It is four miles west of South Petherton, and consequently about five miles from Martock Station, and is used as a farmhouse by a most obliging tenant. Not being a "seat," the 1-in. Ordnance does not take note of it. The idea of using so fine and complete an old house as a modern residence may naturally flash across people's minds from time to time; but its situation, with our modern preferences for windows overlooking good landscapes, would be considered disappointing. The work of adaptation to suit modern habits would be heavy besides. In the result a very perfect thing would probably be nearly spoiled in the attempt to make something more or less imperfect. Barrington was the home of the Phelips family before Sir Edward Phelips built Montacute, between 1580 and 1601.

In the room at Lytes Cary above the panelled room with the Ionic pilasters,—the upper room being 17 ft. by 25 ft.,—is an interesting plaster ceiling. The flat portion of the ceiling is 10 ft. wide, and each slope is 5 ft. Thus the figure, which is based on a square of 5 ft. repeats itself five times in the length of the room, twice on the flat portion of the width, and once on each slope. The setting out is extremely simple, although in the effect it avoids seeming so simple, which is a good point. Several of the ceilings at the delightful Newton Surmaville are of much merit,—that in the drawing-room is especially good. The old and the new,—old walls and windows, old furniture, and the spirit and appliances of refined modern life, make up a house full of charm. The boudoir ceiling at Melbury is boldly designed with large pendants; and there are other ornamental ceilings there, some of them comparatively modern,—the spaces filled in with ornament in low relief, which, like much else at Melbury, are good for living with. Several of the plaster ceilings at Sherborne Castle are very pleasing,—that house will always be looked at owing to Raleigh's connexion with it, and the view of it from the pretty walks among the wood on the other side of the water is very "taking"; on a nearer view there is a good deal of the common place.

The plaster decoration from Montacute occurs in a bedroom on the south front of the splendid house. It is doubtless part of a design for panelling the whole of the walls of the room,—which is about 14 ft. high. A panelled dado rises about one fourth of the height of the room; there was probably plain panelling above that, and there is the deep plaster frieze about 4 ft. 3 in. deep in all,—composed of panels surrounded by ribs and filled in with leafage modelled with much delicacy,—the whole is well in scale and very refined. Mr. J. D. Sedding, relieving the President from one day's guidance, read a paper on Montacute from the steps at the front entrance of the mansion,—the members being grouped round the beautiful porch. This porch and the walls on each side of it were part of the spoil torn from poor Clifton Maybank in 1760. Those who spared no pains, in order that a profitable week might be spent, bear in spirit the pleasant motto over the Montacute doorway,—"And yours, my friends."

New Market Buildings, St. Martin's-lane, Birmingham.—With reference to our notice of these buildings, in our last issue (p. 369), it is only fair to add that the terra cotta of which they are built, and which seems to be very good, was made and supplied by Mr. J. C. Edwards, of Ruabon.

THE FOYER, DAGMAR THEATRE, COPENHAGEN.

C.F.Kell, Photo-Litho. Castle St Holborn.

Wyman & Sons, Printers, Gt Queen St.

THE "KING'S ARMS," ABOUT TO BE ERECTED, EDGWARE-ROAD.

MESSRS. EALES & SON, ARCHITECTS.

Vincent Brooks, Day & Son, Photo-Litho., London, W.C.

NEW POST OFFICE, ALDERSHOTT.

MR. MULLEY, ARCHITECT.

ROOFS IN BUILDINGS VISITED BY THE ARCHITECTURAL ASSOCIATION.

AUGUST, 1883.

Both Ribs.

Ridge & Principal

Purlin & Intermed.e

Nave Roof.

QUEENS CAMEL.

Thos. Garratt del.

Tie Beam

Chancel Roof

QUEENS CAMEL

Thos. Garratt del.

8'6"

6½"

7¼"

11"

Principal

Purlin

Plate similar.

Shaft to floor.

Aisle wall

8.6

5"x4"

Intermed.e without bracket

Principal

Arcade

12.0"

Aisle Roof

YETMINSTER.

and detail of decoration on same

John Fulman mas.r

Red & blue ground alternately

White rays.

white.

blue

white

red

red

black

Brown green

red

white

red

red

red

Red ornament black ground.

Two Bosses. Aisle Roof Yetminster.

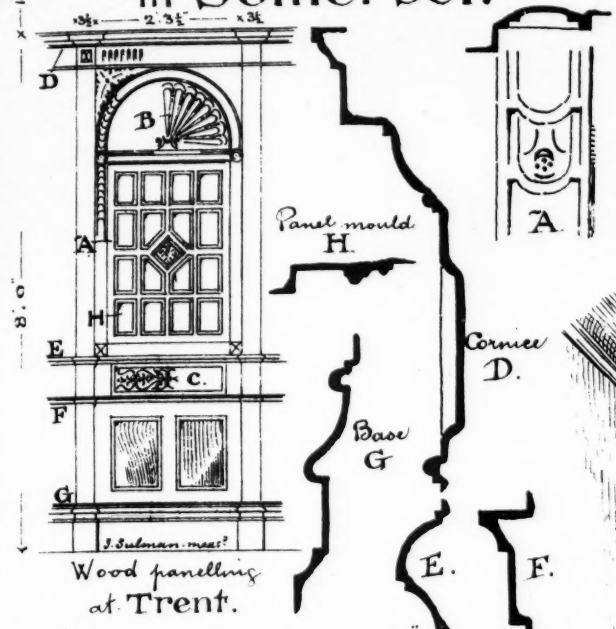
Thos. Garratt del. 83.

Tythe Barn. CERNE ABBAS.

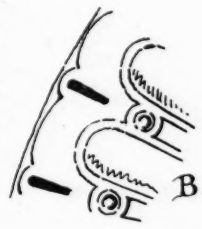
Thos. Garratt del.

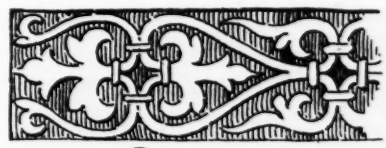
Vincent Brooks, Day & Son, Photo-Litho London

Wood and Plaster-work in Somerset.

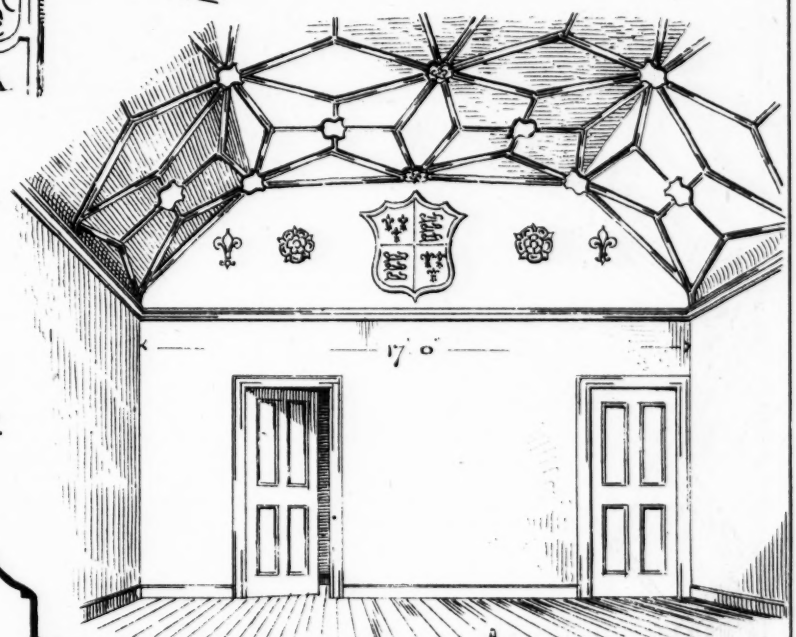


Wood panelling at Trent.

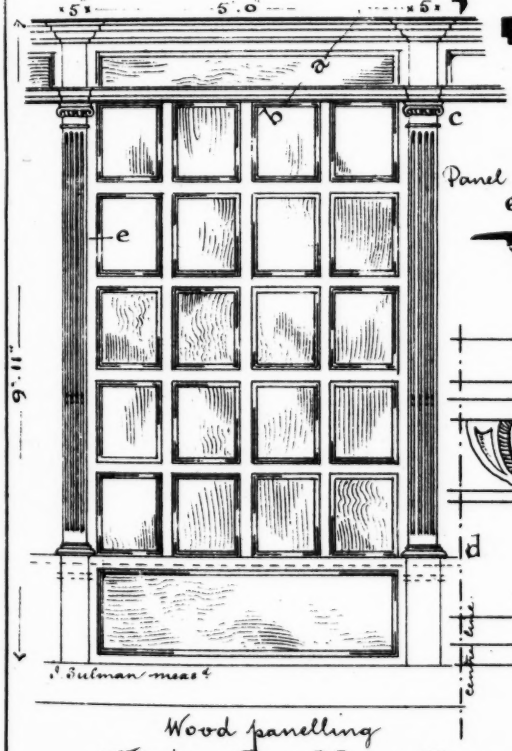




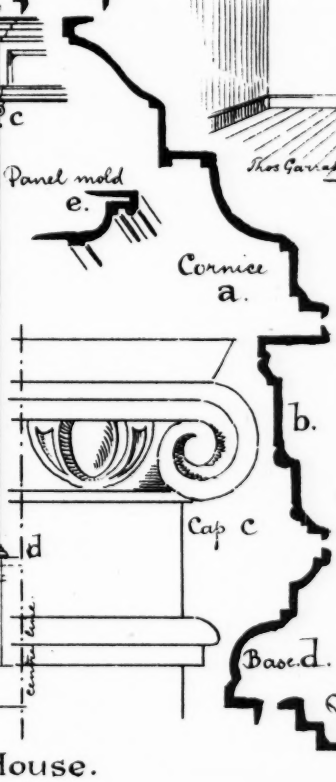
Half Panel C. ⅛ full size.

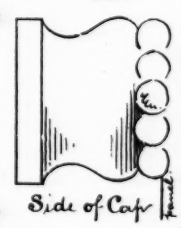


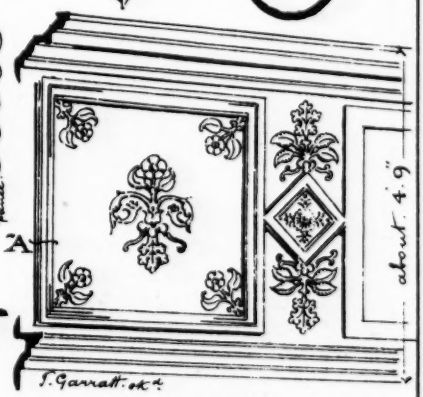
Plaster Ceiling of Upper Room at Lytes Cary.



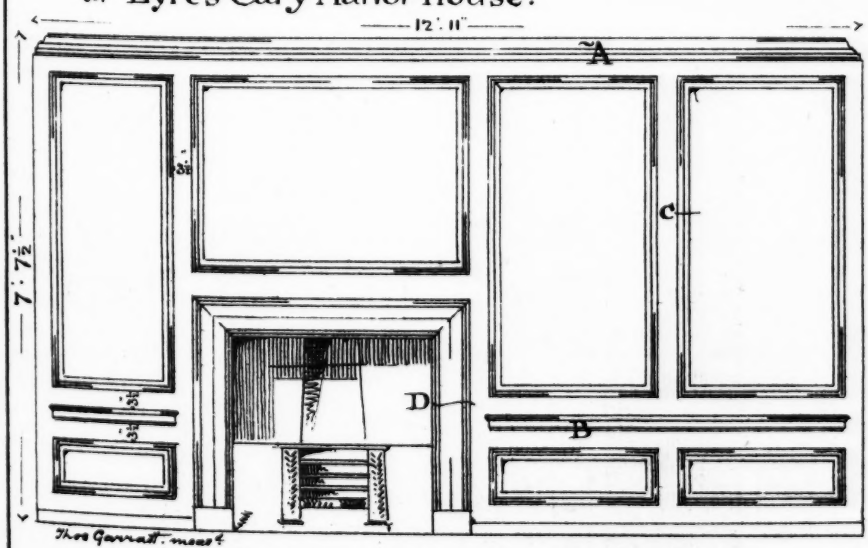
Wood panelling at Lytes Cary Manor House.



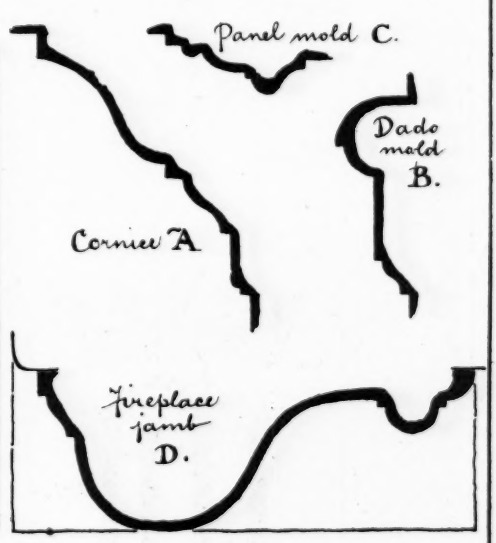




Plaster frieze at Montacute.



Panelling at Barrington Court.



Scale of Feet for Elevations & of inches for details.

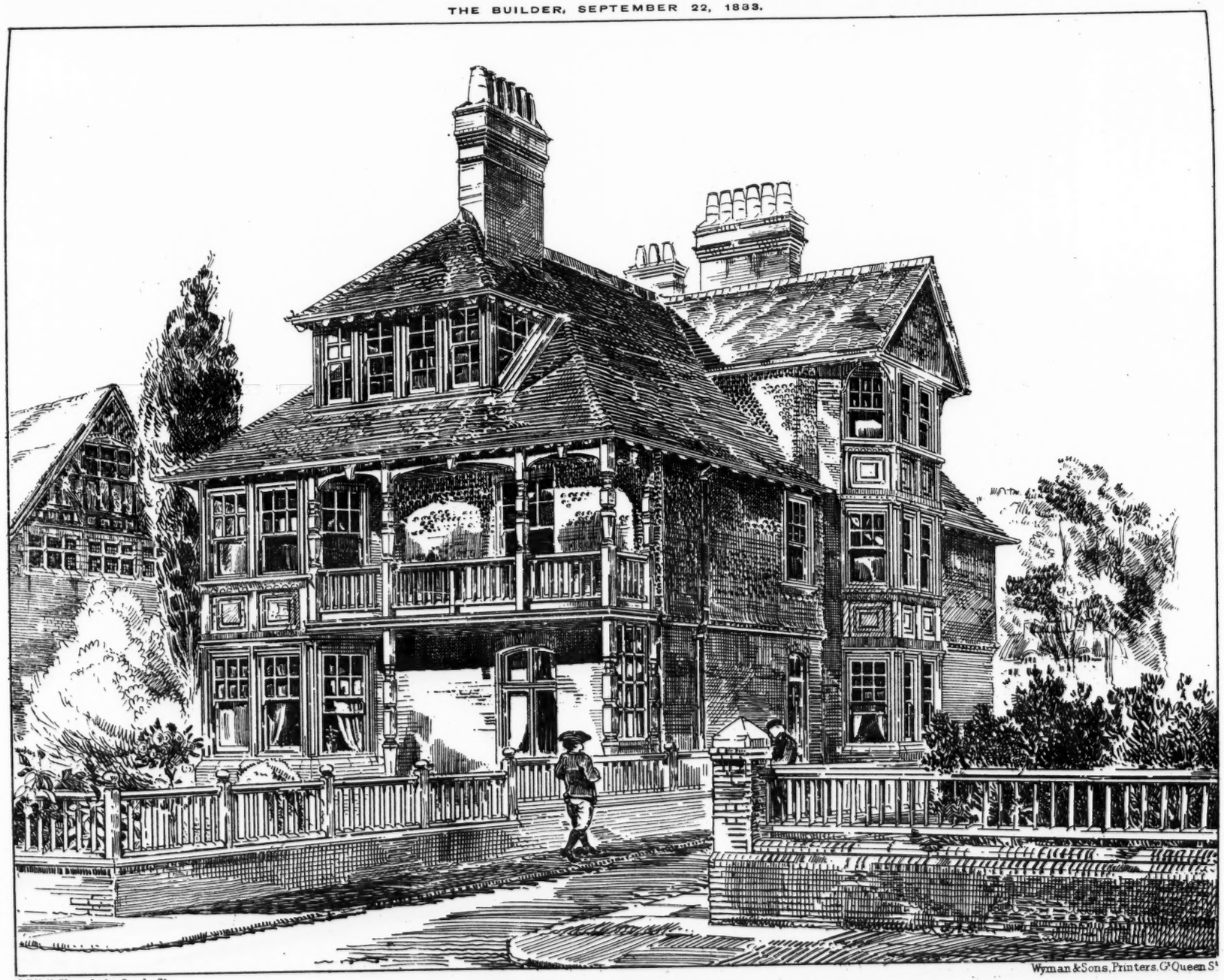
Thos Garratt. del. 1883

Vincent Brooks Day & Son, Photo-Lithog.rs London

Vincent Brooks Day & Son, Photo-Litho., London, W.C.

THE NEW OFFICES FOR "TRUTH"—WESTMINSTER.

MR. HENRY S. LEGG, ARCHITECT, CHRIST'S HOSPITAL.



C.F.Kell, Photo-Litho. Castle St

Wyman & Sons, Printers, Gt Queen St

DWELLING-HOUSE AT WESTGATE-ON-SEA, THANET.—MR. C. N. BEAZLEY, ARCHITECT.

THE DAGMAR THEATRE, COPENHAGEN.

THIS theatre, which is the latest addition to the playhouses of the Danish capital, now four in number, was recently opened, the *élite* of Copenhagen crowding every part of it at the first performance. The size of the new theatre is not too large, the whole of the interior being easily scanned by the eye. With the exception of the cloak-rooms, which are too small and inconveniently placed in the entrance corridor, the whole building is considered very convenient. The defect in question, we understand, is to be remedied. The auditorium is harmoniously decorated in various colours, and picked out with gold. The ceiling contains medallions representing Music, the Drama, Literature, and Painting. There is a large openwork chandelier. There is only one private box, which is reserved for royalty, at the stage end of the first tier. The theatre has two tiers, and a gallery above. The ground-floor contains stalls and pit. A good view of the stage may be obtained from every part of the house. Along the first tier are placed plaster medallions, containing, in relief, portraits of well-known Danish playwrights, authors of farces, light comedies, and national historical dramas. These, together with operettas, are the plays which will be performed. The name of each author is inscribed under the medallion. The faces of the tiers are, besides, adorned with scroll and leaf ornaments in white stucco relief picked out with gold.

The foyer of the theatre, of which we give a view in our present number, is an interesting part of the building. It is readily entered from the auditorium by two openings merely screened off by curtains. The opening at the end leads to the refreshment-room. One entire side of the foyer is lined with couches, placed under the windows overlooking the Jernbanegade. It is in every respect a luxurious lounge. The ornaments consist of carved wood and stucco. The ceiling is also carved in wood and panelled, and adorned with allegorical figures and symbols of the various arts. The chandeliers, depending low from the ceiling, are in bronze, and of handsome design; the globes are supported by winged heads. In a niche in the centre of the foyer, opposite the windows, and between the two openings leading to the auditorium, has been placed the plaster bust of Princess Dagmar of Denmark (Empress of Russia), after whom the theatre has been named. The present bust is to be replaced by one in marble. It is surrounded by exotics, and the niche in which it stands is hung with drapery, the whole being surmounted by an imperial crown and palm-leaves, and the letter "D" in relief on a shield below.

THE "KING'S ARMS," EDGWARE-ROAD.

THIS design has been prepared for the reconstruction of these premises, with a view to the re-arrangement of the frontage lines. The present building stands upon the site of an ancient hostelry, which existed at the time when the Edgware-road connected Tyburn with Harrow and Edgware.

The work is to be finished in red Fareham bricks, Broseley tiles, with dressings of terra-cotta, the ground-story being in red and grey polished granites.

The architects are Messrs. C. Eales & Son, Welbeck-street.

NEW POST-OFFICE, ALDERSHOTT.

THE old office in Wellington-street being found quite inadequate to the steadily-increasing demands upon it, a new building has been erected in the Victoria-road, which, with the Soldiers' Institute adjoining, forms quite an architectural feature in the leading thoroughfare of this rising town. The upper portion of the front is faced with red brick, pointed in dark blue mortar, divided by narrow pilasters and boldly-moulded stringcourses, the panels above the windows being filled in with rose-pattern diaper bricks. The lower part is in Portland cement, with bold cornice and frieze, divided by pilasters into three bays, of which two are filled in with light mullioned windows and the sashes above the transom glazed with stained glass. On the ground-floor ample accommodation has been provided for the public. The telegraph department is placed in rear of the counter, with side entrance for messengers, &c. The clearing and sorting room is ventilated and lighted from above, and the parcels-room is provided with fireproof safe, &c. At this office Government pensioners are now paid their pensions monthly instead of quarterly,—a great boon to a large class of deserving and needy public servants. The upper floors are devoted to the official quarters of the post-master. The work was carried out by Messrs. Martin, Wells, & Co., Aldershott, from designs by Mr. John St. C. Mulley, architect, of that town.

"TRUTH" OFFICE, WESTMINSTER.

ONE of our illustrations represents the new building just now completed in Carteret-street, Queen Anne's-gate, Westminster, and which has been erected for the offices of the publication known as *Truth*. The ground-floor contains the advertisement and general office, with public entrance on the right side of the building; the left entrance leads to the upper part of the premises, which contains the editor's private offices and other rooms. The whole of the front portion of the ground-floor, including the pediments over the doorways, is executed in carefully-selected Bath stone; the cornices and bands to the upper part of the front, as well as the architraves round all the windows, are also in stone. The remaining portion of the front is in dark red brick: hence the building is rather more effective in execution than the engraving represents it. The whole of the work has been carried out in the best manner. The staircase and most of the joiner's work are in pitch-pine varnished, the fittings of the advertisement-office being in mahogany. No contract was entered into, but the work was carried out under a schedule of prices. The architect is Mr. Henry S. Legg, of Christ's Hospital, London, and the builder was Mr. Thompson, of Camden-town, the carving having been executed by Messrs. Daymond & Son, of Vauxhall Bridge-road. The design has been somewhat fettered by the necessity of the cornices having to range with those of an adjoining building northwards.

HOUSE AT WESTGATE-ON-SEA.

THIS house has been erected facing the sea, at Westgate. The materials used are red brick hollow walls to the first floor, then solid brick walls covered with weather tiles; wooden bays, and red tiles for the roofs. The architect is Mr. C. N. Beazley.

DEMOLITIONS AND RESTORATIONS AT LINCOLN'S INN.

THE completion and opening of the Royal Courts of Justice have been followed by the taking down of some of the old courts at Lincoln's Inn.

The block of buildings nearest to the approach through the gateway from Chancery-lane, formerly known as Vice-Chancellor Bacon's and Vice-Chancellor Hall's courts, has already disappeared, and the block on the west side, facing the hall of Lincoln's Inn, formerly occupied by Mr. Justice Fry and other equity judges, is now being taken down. The large court which was occupied by the Lord Chancellor and the Lords of Appeal, and formerly used as the dining-hall of the Inn before the new hall was erected, is not intended to be disturbed, but will remain as one of the most ancient memorials of the Benchers and the Honourable Society of Lincoln's Inn. The private rooms at the north end of this court standing between the court itself and the chapel of the Inn are, however, to be removed, so as to give a better view of the chapel than at present exists, and when all the buildings intended to be demolished have been cleared, the old dining-hall and Appeal Court will stand as a central and prominent structure, and the sites around it which are now being cleared will be ornamentally laid out and planted.

Simultaneously with the work of demolition, extensive reconstruction is in progress at several points within the boundaries of the Inn. The chapel has just been enlarged by the erection of an additional bay at the west end, whilst the roof, which was found to be decaying and insecure, has likewise been entirely reconstructed. The whole of the interior of the chapel has also been renovated and decorated. Mr. Salter, architect, of Woburn-place, furnished the designs for the additions and other works carried out at the chapel, Messrs. Longmire & Burge, of Osnaburg-street, being the contractors.

One of the heaviest portions of the works in progress is the entire reconstruction internally of the east side of Stone-buildings, and the erection of an additional story, architecturally uniform with the existing buildings. The south block is now almost completed. With the exception of the main outer walls, the structure may be said to have been entirely rebuilt. Amongst other portions of the work has been the formation of a basement floor. In the old building the ground-floor rested on walls in the basement, the intervening space between the walls having been filled up with earthwork. In carrying out the work which has just been executed the whole of this earthwork was removed, and during its removal a large quantity of the bones of animals was found at a depth of between 15 ft. and 20 ft. below the ground level. After clearing away this earthwork and bones the basement floor was formed by a layer of concrete 6 in. in thickness in the first instance, and upon this a wooden flooring was constructed. Internally the building has been completely re-arranged, new interior walls, corridors, and stone staircases having been erected in connexion with the several floors. The work throughout appears to be of a very substantial character, whilst the sanitary and ventilating arrangements have not been forgotten. The building as reconstructed contains four floors, thus doubling its capacity as compared with the old structure, namely the basement and additional upper floor. Each floor contains four sets of barristers' chambers, each set containing a barrister's office, an office for his clerk, and a third office for the barrister's pupils, the entire number of offices in the block being fifty-two. Each set of offices has its own lavatory and other conveniences. The north block is about to be similarly reconstructed, whilst the central block is also to undergo extensive alterations and improvements.

The plans and drawings for the works were prepared by Mr. Kaberry, the permanent Clerk of Works to the Honourable Society of Lincoln's Inn, and were approved by Sir Edmund Beckett and the other benchers of the Inn, Mr. Kaberry personally superintending the whole of the works, which are being executed by Messrs. Longmire & Burge.

WORKMEN'S DWELLINGS IN PLYMOUTH.

ABOUT a couple of years since the Plymouth Workmen's Dwellings Company started the erection of their first block of model dwellings on a site abutting on Sutton-road; and this week the fourth and last block has been completed, and the colony of ninety-six families of artisans and labourers fully established in their cleanly, convenient, and healthy homes. Each block is a solid rectangular building of lime-stone, with brick dressings, and the four sets form two parallel streets facing in opposite directions. Though the blocks are not all of the same size, their general arrangement is similar, and a description of one will be a description of the whole. The buildings are divided into four stories, and each story into sets of apartments, consisting of two or three rooms to suit the size or pockets of the family who may become their occupants. There are no means of egress at the back of the blocks, and each "home," whether comprised of two or three rooms, communicates by a single door only to a balcony which runs along the outside. When this door is closed all communication with the set of rooms to which it forms the entrance is cut off, and the occupants are thus able to realise the privileges and advantages of a separate dwelling far more completely than in an ordinary house let out in tenements. Each dwelling includes a living-room, 14 ft. by 15 ft., fitted with a good cooking-stove, a large cupboard, and a receptacle for coal. The bedrooms average 10 ft. by 11 ft., and in the centre of every room is a brick ventilator 12 in. square. All the interior walls of the buildings are of brick, plastered in each room to the height of 7 ft. with Portland cement, and above that with cement of a commoner quality. Each story is reached by a staircase built in a recess, both staircases and galleries being constructed of Caithness stone. But it is in the sanitary appliances and arrangements that the advantages

of these dwellings are said to be conspicuous over the crowded and unhealthy surroundings of the slums and back streets of Plymouth. In the centre of each story is an open space about 12 ft. by 20 ft., which is intended for clothes-drying and similar purposes. Contiguous to each of these spaces are two water-closets and a large wash-house. The latter is fitted with trays, a furnace with water laid on above, and a pipe to carry off the waste water. In addition, there is a large metal shoot, through which ashes and house refuse may be thrown from each story to a bin underground, which will be regularly emptied. Each block has been completed before another was commenced, and the apartments have been let as soon as they have been fit for occupation.

CHELSEA VESTRY HALL.

THE Chelsea Vestry had a long deliberation on Tuesday, the 11th inst. It would appear from the Surveyor's report that the south wall is fractured in several places, and has bulged out towards Manor-gardens to the extent of 5 in. at one point, and the north wall near the ante-room is 3 in. out of the perpendicular.

The cause of the building falling into this dangerous condition, according to the *West Middlesex Advertiser*, seems to be the result of the roof having been badly constructed and made too heavy for the strength of the walls. "That a building which is only twenty-two years old, and which cost about 6,000*l.*, should threaten total collapse, reflects discredit on both the architect and the builder. Several references were made to the original cost of building the hall, but it should be remembered that both labour and material were much cheaper then than now; and, further, that as little as possible was done for the money."

If the hall must be pulled down and re-built as the only effectual cure, the step should be taken at once, and a larger and handsomer building erected.

CARE OF THE PUBLIC HEALTH.

THE Public Health Act, 1875, made it compulsory upon every Local Authority in England (metropolis excepted) to appoint fit and proper persons to be medical officers of health and inspectors of nuisances, and the said Local Authority may also appoint such assistants and other officers as may be necessary and proper for the efficient execution of the above Act.

The duties of these health officers have been fully set forth in order memorandums and instructions issued from time to time by the Local Government Board, and these, too, are not unfrequently found supplemented by certain Local Sanitary Regulations,—the whole aim of such orders and regulations being, in a word, inspection,—inspection of the most practical and trustworthy kind, embracing all matters appertaining to the public health,—the reporting on all circumstances and conditions of life likely to affect it, so that the sanitary regulations made in the interests of the public health may be observed or their breach punished by appropriate orders, penalties, and costs, as in such cases provided; that nuisances and the like, causing injury to health, may be suppressed, and their recurrence prohibited, scavenging duties properly enforced, and cleanliness in both house and person maintained.

In addition to the powers vested in the Local Authority and their health officers by the Sanitary Acts, power is also given to any inhabitant of the district, or to any person aggrieved, who may make complaint to a justice as to the existence of a nuisance under the Public Health Act on any premises, and thereupon the like proceedings shall be had, with the like incidents and consequences as to making of orders, &c., as in the case of complaint by a Local Authority through their officers.

But no one likes to lay such a complaint, and local interests not unfrequently stand in the way of its success when laid. In many cases an unsanitary condition of things dangerous to health is preferred to open conflict with some of the powers that be.

To sanitary authorities have been granted large powers in the interest and care of the public health. The danger is not so much that they abuse their powers, as that they sometimes fail to exercise them sufficiently; for, however alert or vigilant their sanitary officers may be in the performance of their duties, their best endeavours will avail but little unless their efforts are seconded by the Authority under whom they act, and receive the hearty support, co-operation, and appreciative approval of the public. B.

FREE LIBRARY BUILDINGS.

AMONG the interesting and useful papers read at the sixth annual conference of the Library Association of the United Kingdom (held last week in Liverpool, under the presidency of Sir James Picton), was one by Mr. Wm. Henman, A.R.I.B.A., on "Free Library Buildings, their Arrangements and Fittings." In the course of his address Mr. Henman said the free library building must provide for far more than a safe custody of books and provision for occasional readers. It should contain at least three distinct departments, viz., the lending library, the reference library, and the reading-room. The free library must hold a central position, otherwise its benefits would not be taken advantage of to the full. If possible, the buildings should be detached, in order that all parts might be well lighted, and to lessen the risk of damage by fire. Many buildings had been erected on what the speaker considered entirely wrong principles, and even where the general scheme of buildings had been well conceived, he had sometimes noticed that in detail important matters had been either overlooked or ignored. Mr. Henman then dealt with the administrative details of a free library, contended that the two important adjuncts to such an institution were a good catalogue and single indicator, and submitted plans showing his ideas of the arrangements of buildings suited for free library purposes. With regard to library fittings, the bookcases were the most important. In conclusion, the reader said there were at least three methods in use of arranging free library buildings. There was what might be called the single room; secondly, the simple division of the library and reading-rooms; and thirdly, the complex division. His object was to advocate the middle course as the best, but at the same time he was far from desiring that stereotyped plans should in all cases be followed. In this, as in every other class of buildings, the intimate knowledge of the requirements and a careful study of details were essential. With such, an architect might, in conjunction with authors and librarians, help forward the good work which the Free Libraries Acts were destined to accomplish.

PROPOSED ERECTION OF A NEW FEVER HOSPITAL AT COVENTRY.

AT the last meeting of the Coventry City Council a report was submitted from the Sanitary and General Works Committee, and also a report from Dr. Fenton, the Medical Officer of Health, dealing with the objection that had been raised by a number of memorialists to the site selected for the above hospital, and who had petitioned the Council thereon. This site, it appears, has for two years past been openly discussed before the public, and has received the sanction of the Council as the Urban Sanitary Authority and also the approval of the Local Government Board.

We gather, too, from the reports (which were approved) that the site, which is situate off the Stoney Stanton road, is in every respect a very suitable and proper one for the purpose intended, and that whilst paying all due deference to the memorialists, the Council have seen no reason for abandoning it. From the practical experience that has been gained during the past eleven years from the present Fever Hospital, which is near the proposed site, it has been found that although there have been several severe cases of small-pox, scarlet fever, typhoid fever, and measles treated there, no injurious results have accrued to the residents in the neighbourhood. Dr. Fenton, who has had the iron (Fever) hospital under his immediate care since its erection, and has carefully preserved a record of all patients admitted there, states that there is not the slightest evidence in his record to show that disease has existed in the vicinity of the hospital in a greater degree than in any other portion of the district.

Dr. Alfred Hill, the Medical Officer of Health and Public Analyst to the Borough of Birmingham, in his last annual report for the year 1882, also says on this subject:—"It has often been alleged against the establishment of hospitals for the treatment of infectious diseases that they constitute centres of infection and a danger to the neighbourhood, and, though this contention has been disproved over and over again, and is always in process of being disproved both in Birmingham and other towns, it continues, like many other popular errors, to maintain its existence as if it were an established and important truth. It may be well, therefore, to state in reference to the Borough Hospital (Birmingham) which has been so serviceable, that in no instance has any case occurred in the neighbourhood of the hospital which could be traceable to it."

THE TRANSMISSION OF ELECTRIC POWER.

M. MARCEL DEPREZ, the electrician, who is well known for his labours in connexion with the transmission of power by electricity along wires of small diameter, has just concluded a series of experiments extending over two months, the results of which appear likely to prove of considerable practical value. At a distance of eight miles and three quarters, through a wire only two millimètres thick, with the help of a mountain stream at Vizille, which he employed as a motive power to work a dynamo machine of his own invention, M. Deprez was able last week to light one hundred and ten Edison lamps in the Town Hall at Grenoble. Large crowds were present, and appeared greatly impressed with the effects produced.

HOTEL BUILDING IN THE CITY.

WHILST at the West End several monster hotels are at present in course of erection, hotel buildings and extensions are also proceeding at a rapid rate in several parts of the City. Amongst others the City Terminus Hotel in Cannon-street is about to undergo a considerable enlargement, the hotel, spacious as it is, having been found inadequate to the demands made upon it, not only for the accommodation of travellers and others, but also for the meetings of companies and other like purposes. The intended enlargement consists of a new wing at the east side, which will be uniform in height and architectural elevation with the existing building, and in which it is stated there will be upwards of 100 reception and bed rooms. Mr. Charles Barry is the architect, and Mr. Booth is the contractor, the estimated cost of the building being 22,000*l.* The old and well-established hostelrie in Crown-court, Cheapside, known as Kennan's Hotel, is also about to be taken down, and replaced by a new structure of more modern and larger proportions. Mr. J. T. Wimperis is the architect, and Messrs. Fish & Co. the contractors. The new building will cost between 11,000*l.* and 12,000*l.* The large and costly hotel for the Great Eastern Railway Company, at the Liverpool-street Station, which has been in course of erection during the last few years, is now fast approaching completion, and is expected to be ready for opening about the end of the year. The Bishopsgate frontage of the structure, and the south elevation in Liverpool-street, has been completed for some time past, and last week that part of the structure immediately adjoining the entrance to the station was covered in. Mr. C. E. Barry is the architect of this spacious structure, and Messrs. Bangs & Co. are the contractors.

Workhouse Building and Sanitary Work. At a recent meeting of the Chelsea Board of Guardians, of which Sir Charles Dilke, the President of the Local Government Board, is a member, Dr. Bridges, Medical Inspector of the Local Government Board, said he wished to take the opportunity of congratulating the Board on the completion of their new workhouse building, which he had had the pleasure of carefully inspecting. It was extremely well constructed and admirably adapted for the purposes for which it was erected. The new buildings are the work of Mr. A. Thorn, builder, and were designed and erected under the superintendence of Messrs. A. & C. Harston, architects.

THE TRADE UNIONS CONGRESS AT NOTTINGHAM.*

MR. FREDERIC HARRISON, in the course of the address to which allusion has been made, reviewed the progress of trade societies since the federation had been effected which had its expression in the Congress. He should think it was as unnecessary to read a paper in defence of trade unions as in defence of railways or any other accepted institution. He reminded them that sixteen years had passed since the sitting of the Trade Unions Commission, which was followed by the Act of 1871 and the legislation of 1875, freeing trade unions from the disabilities which formerly affected them. Now, therefore, the trade unionists could look back and contrast their present position with their past, and ask themselves whether they had fairly used the concessions they had received, while they could point to the fact that since these concessions, during a time of unexampled stagnation in trade, the struggles between capital and labour had been of a less acute character than at any previous time in England. He was not speaking exactly as an outsider, for many years ago he was accepted as a member of one of the great amalgamated societies, hence he was speaking as an old trade unionist. If any one wanted to obtain a view of the progress of trade unions, reference to the paper by Mr. George Howell in the *Contemporary Review* would give valuable information. An investigation of the affairs of the trade unions gave striking facts of the steady progress of the unions in numbers and income. In 1867, for instance, the year of the Trade Unions Commission, the Amalgamated Engineers numbered 33,000, while in the last returns they numbered 44,000, and he was informed that at that moment they numbered 50,000. The Amalgamated Carpenters, who numbered 8,000 sixteen years ago, now numbered 20,000; the Amalgamated Tailors, whose union did not exist in 1867, now numbered 13,000; and the Iron-founders had risen from 10,000 to 11,000. In all, five societies, whose members did not number 60,000 in 1867, now numbered 125,000. Then, as to the income of these societies, he gave statistics showing that the incomes had increased cent. per cent. during the sixteen years which had elapsed since the Congress came into existence, and the trade unions were not only twice as rich as they were, but they were twice as strong, and had vastly increased their reserve. This increase of power, and means, too, had been in the face of great depression of trade and manufactures, and in the face of great expenditure on the part of great societies, for the sum of 2,000,000*l.* had been spent by five societies within six years, and yet a cash balance was left of 360,000*l.*, which represented the self-denial, the self-reliance, and the self-dependence of the industrious classes. Some of these societies, too, had existed over long periods, and they had been of vast benefit to the community at large by the support they had afforded to workmen and their families in distress, and the community at large had gained to this great extent. It would be impossible to calculate how much these great trade unions had saved the country in money given in times of distress, and how much they had done to allay the irritation which arose in those times. It was preposterous for persons to look upon the trade unions, as many were disposed to look upon them, as mainly existing for the purpose of dealing with trade disputes; and to show that this commonly-accepted view was altogether wrong, he called attention to the heads of expenditure of the societies, and emphasised the fact that in the whole the expenditure on "trade purposes,"—or, in other words, in trade disputes,—had been only one per cent. of the income, while seven societies which had had to meet trade disputes had only spent two per cent. of their income under this head. He did not say that money spent upon strikes was not well spent in some circumstances, but when he found seven societies, whose reserve amounted to 750,000*l.*, spent less than one per cent. of their income upon strikes, he could declare that it was a vulgar error to represent the maintenance of trade disputes as the main purpose of trade unions. The working out of the trade unions in these sixteen years showed the faultiness and weakness of the advice which the Trade Unions Commission offered when that body proposed that the "trade" and the "benefit" purposes of the unions should be divided.

In concluding his address, Mr. Harrison dealt with social questions, and urged the working men to direct their attention to local self-government, in which, he urged, they should take a part. They were more interested than the rich (who could choose their own district) in the sanitary condition of the localities in which they lived, in the supply of good water, in lighting, the supply of efficient schools, and in lessening the evils which depressed or burdened life, as well as in the means of culture.

Mr. Burnett, of London, in proposing a vote of thanks to Mr. Harrison, urged that the Congress should take some steps to secure from the whole of the trade unions of the country, large and small, reports to the Parliamentary Committee. By this means the committee would be enabled to lay before the Congress annual statements as to the work which was being done by the unions, and the public would see the progress they were making. Mr. Harrison had touched what might be called the sore spot of their organisations,—the subject of superannuation benefits. He (Mr. Burnett) regarded the work of the unions in this direction as among the most useful which they undertook; and there was no doubt that this branch of their organisations required most careful attention, for it was one which they must never give up. The calculations of actuaries were too scientific to be applied to trade unions. They left outside their calculations many little matters of principle which, as well as figures, had a bearing on the case. At any rate, the predictions of those who gave evidence before the Royal Commission of 1867 had been falsified, for had their prophecies been fulfilled the superannuation benefits of their societies would have broken down long ago. He thought that the non-compulsory funds which existed among them would help to obviate the danger of the collapse of their superannuation benefits.

Mr. Cremer having seconded the resolution, Mr. Knight, of London, pointed out an error in Mr. Harrison's figures, and mentioned that the income of the boiler-makers was now 65,000*l.*, and not 42,000*l.* as stated by Mr. Harrison.

Mr. Swift, of Manchester, attributed the increase of superannuation expenditure to some extent to the fact that many employers now refused to engage workmen who were somewhat advanced in years.

The resolution was then put, and carried unanimously.

After some time given to the consideration of a resolution (which was agreed to) urging the Government to complete the codification of the Criminal Law, the subject of boiler and steam engine accidents was discussed. In the course of the observations made it was stated that many of these accidents were caused by the boilers and engines being entrusted to young boys and other unqualified persons. On the motion of Mr. Lambton, seconded by Mr. Swift, of Manchester, a resolution was carried instructing the Parliamentary Committee to take energetic steps to obtain legislative prohibition against any but duly qualified and certified persons taking charge of steam-engines and boilers.

Mr. Birtwistle, of Accrington, moved a resolution in favour of the appointment of additional inspectors for factories and workshops, and representatives of the women's trade unions urged that women inspectors were as necessary as men inspectors.

The resolution was, after some discussion, carried in the following form:—

"It is with deep regret that this Congress learns that the Government have not yet seen fit to accede to their often-repeated request for the appointment of an additional number of practical women and men as factory and workshop inspectors. They, therefore, instruct the Parliamentary Committee to renew their exertions to point out to the Government the utter inability of the present staff to maintain a due observance of the law."

On Thursday, the 13th, the subject of extending the hours of polling at Parliamentary and municipal elections all over the United Kingdom was discussed, and a resolution agreed to.

In the evening, at the great Albert Hall, Nottingham, a large audience assembled, on the joint invitation of the Trades Guild of Learning,—a body associated with the Nottingham University College,—and the Local Trades Committee, to assist in the work of encouraging technical education. Mr. Samuel Morley, M.P., who presided, said that, as an employer, he was as deeply interested in the subject as any working man, for he considered technical education to be a subject of vital importance. He gratefully recognised the improved tone now prevailing generally between employers and employed. Proceeding to deal with the special object of the meeting, he said that technical education was the means by which the working classes of every English town could qualify themselves for every form of competition. The truth was that competition in manufactures was becoming a competition of intellect, and it was desired that the English workmen should be thorough masters of their trades. The competition from the Continent in the education of the workers was due to the munificent provision for technical education which foreign municipalities had made, and to the acceptance of that provision by the workers. If England was to maintain her position as a manufacturing country the workers must give attention to technical education.

Mr. Summers, M.P., moved a resolution in favour of the adoption of a comprehensive scheme of trade instruction.

Mr. Woodall, M.P., in seconding the motion, speaking as a Royal Commissioner, remarked that, though he would not say that the purely literary education had lessened the handicraft ability of the people of England, yet, looking at the great number of candidates for clerkships, and the increase of technical knowledge abroad, he could not but remind them of Mr. Gladstone's advice, that they should endeavour to elevate handicrafts in place of rushing into the supposed paradise of pen and ink. He also showed that poor districts abroad spent six times the amount spent in England in provision for primary education, which included early introduction to tools.

The motion was carried *nem. con.*, as was another proposed by Colonel Seely, M.P., seconded by Alderman Cropper, thanking the University College for the institution of a technical school, urging working-men to accept the instruction offered, and hoping that employers and trade unions throughout the country would co-operate to encourage such institutions.

On Friday, the 14th, the land question (the discussion of which was opened on the previous day) was before the Congress, on the following motion of Mr. Joseph Arch:—

"That, considering the large number of acres of waste land capable of cultivation, as well as large quantities not more than half cultivated, the Congress is of opinion that radical changes in our land system are immediately required, so that the land may be cultivated for the benefit of the entire community."

To this an amendment, or addition, as it was termed, was proposed by Mr. Rowland, the representative of the London cabdrivers, the addition declaring that "nationalisation" of the land, in favour of which the Congress declared itself last year, was the only means by which the evils connected with the land could be remedied. After considerable discussion, Mr. Rowland's amendment was negatived by 90 to 34.

Mr. Broadhurst, M.P., next brought before the Congress a letter which he had received from Paris, addressed to the Congress, and dated from "Le Comité National, Parti Ouvrier, Socialist, Révolutionnaire, Français," Paris, August 26. It invited the presence of delegates from English trade unions at an international congress of representatives of workmen's organisations, to be held in Paris next month.

Mr. Broadhurst proceeded to say that, in reply to that communication he had written that the matter should be brought before the Congress, and had asked whether the 15th of October had been permanently fixed as the date of the conference. He had received an answer to the effect that any time between the 15th and 30th of October would be suitable.

After some discussion the matter was referred to the Parliamentary Committee to make the necessary inquiries, and, in case of their being satisfied, that they should recommend the trade unions to appoint delegates, and should themselves be empowered to appoint a deputation to attend the conference. In this shape the resolution was unanimously carried.

The subject of the "Recovery of Wages" was then brought before the Congress by Mr. Thomas Smyth, of London, who moved:—"That in the opinion of the Congress it is desirable that for the recovery of wages a work-

* See p. 366, *ante*.

man shall have a first lien on the work accomplished by him, and that the Parliamentary Committee take action to so amend the law that he may recover by distraint or otherwise."

Mr. Knight, of Birmingham, seconded the motion, and after a discussion, in which illustrations were given of the operation of the law as at present existing, the motion was adopted.

The places nominated for the next year's Congress were Aberdeen, Stoke-upon-Trent, Hull, and Birmingham. The Congress elected to go to the first-named place.

In the evening the members went to the Castle Museum, where the Mayor gave a *conversazione*.

The Congress was brought to a close on Saturday last.

THE CHURCH CONGRESS HALL, READING.

To meet the requirements of the forthcoming Church Congress (which is to be held in Reading on the 2nd, 3rd, 4th, and 5th of next month), the Building Committee have erected commodious temporary buildings in the Forbury, to supplement the accommodation afforded by the old and new town-halls. These temporary buildings, which are of great extent, have been erected by Mr. T. H. Kingerlee, builder, Banbury, from the plans and under the superintendence of Mr. F. W. Albury, of Reading, hon. architect to the Congress. The large hall will provide accommodation for 3,000 persons. Possession of the site was taken on the 4th of July, and the work was completed in nine weeks. No less than 13,000 cubic feet of timber, 50,000 superficial feet of inch boarding, 40,000 feet of match boarding, 23,000 feet of roofing felt, 4,000 feet of glass, 3½ tons of iron, and 2 tons of nails and bolts, have been used, the total weight of timber being about 400 tons, and forty workmen have been employed in the work, under Mr. Reed, foreman to the contractor. The hall will be lighted by means of a continuous circuit of pipes, having gas jets 9 in. apart, and equal to 5,600 candles, the supply being in duplicate from two large meters. Means of ventilation, and also special means for entrances and speedy exit, have been arranged.

The feeling is already being generally expressed (says the *Reading Mercury*) that it would be a pity to remove such large and convenient buildings, which are so substantially constructed that they would last for years, and could be utilised for many purposes,—indeed, a similar building will be necessary next year for the great Friendly Society's meetings,—the Oddfellows' "A.M.C.,"—which will be held at Reading in 1884.

TAPESTRY AT THE NATIONAL EXHIBITION OF FINE ARTS AT PARIS.

A LARGE number of extremely interesting pieces of ancient tapestry are exhibited in the garden and on the external gallery of the upper floor, as well as the entrance vestibule of this exhibition. Before the Revolution of 1798 there were about 3,000 pieces of tapestry in the different royal palaces in France, the result of various purchases made by Francis I. and his successors, and the produce of the looms set up by Sully in the reign of Henry IV. In 1793 the Convention, who appear to have been unaware of the artistic value of these tapestries, sold them for an insignificant sum, with the exception of some 700 or 800 which were at Versailles and were overlooked. Under the Directory and the First Empire they continued to be neglected, but on the Restoration the Government of the day had them transferred to Paris, where they were used on the occasion of religious festivals and processions. Louis Philippe also employed them as decorations at certain official rejoicings.

It was not, however, until the accession of Louis Napoleon, that these tapestries became fashionable again. The emperor decorated all the Imperial palaces with them in succession, including Compiègne, Fontainebleau, Saint-Cloud, Pau, and the Tuileries. There they remained until the outbreak of the war with Germany, but on the approach of the Prussians they were removed from the country to Paris, and placed in the Garde-Meuble, or Royal Furniture Depôt. The tapestries at the Tuileries were not removed, but were hidden in the cellars, where they were found in perfect preservation after the Commune. The only things which were not destroyed in the conflagration of the palace were the wine and the tapestries belonging to the Crown.

The tapestries which were formerly in the palaces of Pau, Compiègne, and Fontainebleau have been restored to the positions they occupied before the war; the others, to the number of about 550, are still in the Garde-Meuble, and it is from among these last the specimens (most of which date from the seventeenth and eighteenth centuries) have been selected which are now on view at the National Exhibition.

Those which will most interest an Englishman are the tapestries numbered from 19 to 24, which were manufactured at Mortlake, at the factory established there by Charles I., from the cartoons representing scenes in the life of the Apostles, by Raffaelle, portions of which cartoons are preserved at South Kensington.

A large number of these tapestries were executed at the royal factory at Gobelins, from the designs of Giulio Romano, Le Brun, Coypel, and others, which excite only a moderate degree of interest in the present day, although the drawing and manufacture are equally accurate in execution.

THE TEACHING OF DOMESTIC ECONOMY IN SCHOOLS.

THERE is, says Mr. Fitch, one of H.M. Inspectors of Schools, in his report on the East Lambeth Schools, "a little pathos and a slight *soupçon* of absurdity in the written answers of poor little girls who come from the dingy and squalid alleys of Lock's Fields, and who tell me in their papers that 'a dwelling-house should be built on rising ground, with a southern aspect, and on a sandy soil.' On the whole, the answers to questions on clothing, health, and ventilation are generally much better, and more likely to be turned to useful account, than those on the properties and composition of food. These last consist, not unfrequently, of mere verbiage, and cannot be made practically intelligible without more knowledge, not only of elementary chemistry and physiology, but also of the art of cookery, than can possibly be acquired by such young scholars."

Doubtless, as this extract shows, the difficulties of teaching "domestic economy" in schools are very great, chiefly on account of the largeness of the subject and the varying capacities and the limited opportunities of the scholars for giving practical effect to what they are taught. All the more necessary is it that the well-meant efforts of the School Boards should be supplemented by the voluntary help of ladies, clergymen, medical men, nurses, and others, who might in many localities combine together in a work of real philanthropy by holding meetings or classes for the dissemination of the first principles of sanitary science and domestic economy.

ST. CUTHBERT'S CHURCH, DARLINGTON.

A MARBLE monument has been erected in the south transept of this church, to the memory of the late Mr. R. H. Allan. The design is in the form of a canopied "altar-tomb," adapted to suit its position against a blank wall, built about 1375, to strengthen the building when the tower was raised. The monument is designed in the "Decorated" style of that period.

Two angel corbels support buttresses surmounted by elaborately-carved pinnacles at the angles, between which a richly-carved cornice carries the intermediate portion of the structure. Above this is the "altar-tomb," in the front of which very ornate tracery and canopies surround eight panels, which contain shields emblazoned with the numerous quarterings of Mr. Allan. Over this "altar-tomb" is a large panel of black marble, containing a long inscription, and it is surmounted by a very elaborately-carved ogee canopy, covered with crockets and finials, and having its spandrels filled with elegant foliage.

With the exception of the large panel of black marble, the whole of the monument is of the purest white statuary, and though only about 6 ft. by 8 ft., has cost 500*l*. It has been executed by Mr. Harry Hems, sculptor, of Exeter, from the design and working drawings of Mr. J. P. Pritchett, architect, of Darlington.

BUILDINGS FOR POOR-LAW ADMINISTRATION.

Holywell.—Considerable alterations are in course of being made at Holywell Workhouse, in order to enable the guardians more efficaciously to apply the "house test." For the purpose of appropriating additional space for the inmates, large vagrant wards on the "cell" principle are being built, and a spacious chapel is to be erected on the lawn at the side of the workhouse. The plans of Mr. Douglas, architect, Chester, have been adopted, and the contract for the buildings has been let to Mr. T. W. Gibeon, of Holywell.

Newington.—At the meeting of the St. Saviour's Guardians on the 13th inst., the clerk read a letter from Messrs. Jarvis & Son, architects, stating that, in accordance with instructions from the Guardians, they had made an estimate of the fair marketable value of the land and houses adjoining the Newington Infirmary, Walworth-common, which it was proposed to acquire in order to add to the present buildings. The estimated value of the land and houses was 17,962*l*.; but Messrs. Jarvis added that if the property had to be acquired under the Lands Clauses Act, 10 per cent. would have to be added, and the total cost of acquiring the buildings would, therefore, probably be 19,758*l*., exclusive of law and other expenses. The letter was referred to the special committee appointed to consider the matter.

TESTS FOR BUILDERS IN PRUSSIA.

A STATISTICAL return has been published in the German technical press which deals with the results of the examination held between 1878 and 1883 in various cities for testing the capacity of persons for conducting building operations. In Berlin, Hanover, Aix-la-Chapelle, there have been, during the five years in question, 1,568 candidates examined, of whom 1,075 were approved, while 493 failed to arrive at the required standard.

IMPROVEMENTS IN LONDON WALL.

HOUSE and shop carpenters and joiners are just now very busy in London-wall. The footpath on the north side of that thoroughfare between Moorgate-street and Blomfield-street has been lowered to the extent of between 2 ft. and 3 ft., in connexion with the laying down of asphalte pavement along the carriage-way. The lowering of the footpath has rendered necessary extensive alterations to the houses and shops along the line of route, upwards of 100 in number. In many cases the houses have been underpinned, and the basements carried to an increased depth corresponding with that to which the footpath has been lowered. New shop-fronts have likewise been placed in the various places of business along the road, carried to a greatly increased depth, and imparting a considerably improved appearance to the shop architecture of the locality, whilst it has at the same time greatly increased the value of the several properties in this business centre. The lowering of the footpath extends into Circus-place, and also into a portion of Blomfield-street, and at the corner of Circus-place it has involved the entire refronting of one of the houses from the foundations upwards.

ART-EXHIBITIONS IN THE PROVINCES.

Nottingham.—The third autumn exhibition of pictures in Nottingham, opened on the 8th inst., is spoken of by those who have seen it as in some respects in advance of previous exhibitions, the number of pictures being up to the average, while the general quality is higher than usual. When it is remembered that two of the largest provincial exhibitions are being held at the present time,—Liverpool and Manchester,—the fact of so many good works having been secured argues hard work on the part of Mr. Wallis and the Castle Museum Committee, for the two Lancashire cities have a reputation as selling exhibitions second only to the great London shows themselves. In all, there are about 450 pictures hung in the water-colour gallery.

Birmingham.—The exhibition of the Royal Birmingham Society of Artists, now open at the Society's rooms in New-street, while con-

taining a great many meritorious pictures by local artists, includes several noteworthy pictures from recent Academy and other exhibitions. Among these may be mentioned the "Phryne at Eleusis," by Sir Frederick Leighton; Mr. Alma Tadema's "Oleander," from this year's Academy exhibition; Mr. Millais's portrait of Mr. Hook, R.A.; Mr. Frank Dicksee's "Harmony," which was bought by the Royal Academy with the Chantrey bequest; Mr. Albert Moore's "Dreamers"; the "Spanish Letter-writer" of Mr. Burgess; Mr. Logsdail's picture of the Piazza of St. Mark's, Venice; the study of "Clytemnestra," by Mr. John Collier; Mr. Brett's sketch of sunlit sea and rocks, entitled the "Welsh Dragons"; Mr. Frank Topham's scene from Florentine history, "A Messenger of Good Tidings"; and the "Love Birds" of Mr. Sant. Altogether some twenty members or associates of the Academy are represented on the walls.

"COAL-YARD."

SIR,—Having been rusticating for a short holiday I did not see the issue of September 1st, in which your contributor replied to mine *re* Coal-yard, until returning to the great town of smoke and wealth. I certainly cannot accept map-makers as authorities for correctly naming places, as my experience is that they are extremely faulty in that respect. I could give several instances of this. The fact of Rocque's naming an approach to Coal-yard without the prefix, and the yard itself with it, is slightly in my favour, showing that no established rule had been laid down regarding it. Smart's Buildings may have been called "Cole-yard" in 1736; but forty years after that date I have an account of an execution of three persons taking place at the north end of the buildings for a murder and robbery in them. But that is of little moment. The question is: Was this place ever used as a store for coals? If so, the *The* can be understood. No one seems to know anything about it. One of the inhabitants that I questioned some time since has a legendary notion that a Lord Cole had a residence here in a house superior to its surroundings, of about Charles II. or William III.'s time, demolished for the purpose of the School Board, and of which I have preserved a pen-and-ink sketch. Parton does not mention any such titled resident in his History, so the name remains as obscure as it is old. I acknowledge that the parish books lean to your contributor's view, as the following extracts show:

	s.	d.
1648. Pd. the Coroner his fee for viewing one Farmer's child in the Cole-yard, drowned in a tub of water	6	8

And during the Civil War:—

— Recd. from Isabel Johnson, at ye Cole-yard, for drinking on the Sabbath	7	0

But then "the" is generally prefixed to Seven Dials by persons when speaking of it, both near and at a distance (locally abbreviated to "The Dials"), the same as it is to Broadway, Westminster.

F. A CHART.

PLUMBERS.

SIR,—I notice the Turners' Company are offering substantial prizes for competition in the various branches of the trade they represent. May I venture, as a working plumber, to suggest to you the benefit our trade would receive if a similar undertaking could be promoted by the Plumbers' Company? I think it would at once become popular, and would prove as successful as others of the kind. Our craft sadly needs the encouragement an exhibition would give, and I am confident there would be no lack of competition amongstt the journeymen of London, the majority of whom would be glad to do something towards removing the unfavourable impression the plumber generally creates wherever he goes. J. R. FROST.

PLANS OF GAOLS.

IN the report of H.M. Canadian Inspector of Prisons, the reporter, speaking of Goderich Gaol, says:—"The most serious defect is what was at one time looked upon as structural perfection, namely, the radiation of the wards from a common centre. The principle is faulty and exceedingly insecure, inasmuch as it affords such a number of rooms, nooks, angles and yards, where plotting and scheming amongst the prisoners can be carried on with much greater impunity, and to a larger extent, than in a gaol constructed on modern principles, where skulking places are reduced to a minimum."

The Crystal Palace.—The directors have completed arrangements for holding an International Exhibition of Arts, Manufactures, Science, and Industry, during 1884. It is intended that the exhibition shall be opened on April 3, and close at the end of October, 1884.

THE NEW TOWN-HALL, VIENNA.

ON the 12th inst., the second day of the bi-centenary festival in celebration of the relief of Vienna from the besieging Turkish army by John Sobieski, king of Poland, the ceremony of laying the finishing stone of the new Vienna Town-hall was performed by the Emperor Francis Joseph, who ten years ago laid the foundation stone of the building, which has now grown into the most magnificent of all the palaces on the Ringstrasse. It stands facing the new Burg Theatre, between the new Parliament House and the new University buildings. It is rectangular in form, and covers an area of 18,700 square mètres, with a frontage of 152 mètres in the Ringstrasse. The principal tower is 100 mètres high, being only fourteen less than St. Stephen's Tower; and the four smaller ones are 61 mètres each. The whole building has cost 14,000,000 florins. In his plans the architect, Herr Friedrich Schmidt, has endeavoured to combine the Gothic style with the Renaissance, but the former prevails.

A general view of the buildings appeared in the *Builder* volume (xxxv.) for 1877, p. 980; and more recently we gave another and larger view, with portions of the interior (vol. xli. (1881)., p. 516).

Books.

The Guild Merchant of Preston, 1882. By WILLIAM POLLARD. Preston: H. Oakey.

PRESTON is the only town in the United Kingdom which can boast of the periodical observance of a ceremony which was at one time universally observed, and, even at Preston, little is left of its Ancient Guild but the name and an occasional bout of miscellaneous revelry. The Guild dates from 1328, and, in the earlier portion of its existence held, at uncertain intervals, meetings half religious, half mercantile, on a large scale, one feature of which was a vast trades' procession, with their emblems and banners, religious and secular. Since the year 1500 these meetings have been held with scrupulous regularity every twentieth year, that celebrated in 1882 being the twenty-fourth of the series. It says much for the good old Lancashire town and for the Lancashire constitution that in one parish there were to be found last year no fewer than twelve persons who had each witnessed five of these celebrations. It is customary to make the meeting the occasion of inaugurating some work of public utility, and at the last the foundation stone of the Harris Free Library and Museum was laid with extraordinary *éclat*. The good people of Preston were disappointed of the presence of the Prince and Princess of Wales, and their substitutes, the Duke and Duchess of Albany, were prevented from filling their places. At the last moment the Duke of Cambridge, at the Queen's personal request, did the honours, and all went merry as a marriage-bell.

The book before us is apparently for the most part a compilation from newspaper reports of the week's doings (our own pages having been laid under contribution for an architectural description of the new library), and it will in future years have an antiquarian interest, preserving, as it does, a more than usually copious, and no doubt quite faithful, record of a pageant which must in the natural course of things dwindle and die. What the Dryasdust of the future who peruses the mayor's *menu* will make of the "Othellos" and "Desdemonas" amongst the dessert we cannot pretend to say: they are mysteries to us. There is an odd misquotation of Macaulay at p. 127. The book is avowedly a "descriptive narrative," and nothing more, and as such it well fulfils the promise of its title-page.

Professional Papers of the Corps of Royal Engineers. Edited by Major VETCH, R.E. Vol. viii. 1882. London: Stanford.

THIS volume comprises eleven papers on varied subjects, and has something for every taste. The editor calls special attention to Col. Maquay's contribution on Field Railways, which brings within a narrow compass the lessons learned in our recent "little wars." Captain Abney's name is a guarantee for the excellence of his paper on the Organic Compounds of the Sun, and the interest attaching to Captain Browne's description of the bridges constructed over the Kabul river is not limited to military readers.

But Captain Clarke's paper on Provisional Fortification has perhaps the widest claims to notice. It is a continuation of a paper by the same author contributed to vol. iii. of the series, and was inspired by a lecture delivered to Engineer officers at Berlin by Captain Von Wittenburg, who found his theme in the remarkable defence of Plevna in the late Russo-Turkish war.

Military architecture is a thing of the past; it has ceased to be, and one field in which the architect has won some of his greatest triumphs is henceforth closed to him. The mason disappears before the navvy, and in "the whirligig of time" the spade once more asserts its old supremacy. The modern breechloading rifle has altered the whole course of defensive warfare, and the deadly nature of its fire has in respect to works of defence "diminished the importance of their trace and even of the necessity for the provision of flanking fire." It is probable that the engineer's object henceforth will be to delay an attacking force on the glacis of a fort under a murderous fire from its parapets rather than to secure it against capture, by the interposition of vertical scarps and ditches enfiladed by musketry, and on this assumption the plans for provisional forts which illustrate Captain Clarke's paper, based upon German models, have been framed. The gist of his paper is that such "type-plans" should be thought out to their minutest detail in times of peace, so that they may be constructed without hitch, and at great speed, in times of emergency. Two months he estimates as the extreme time required for the construction of such a work to accommodate a garrison of 300 defenders. The relief is low, some 7 ft. or 8 ft., and the parapets thin, not more than 20 ft. The front faces are flanked by a Caponier at the salient, but the flanks are only "more or less defended" by direct fire from the parapets. In place of the escarp there is a slope or sort of inner glacis, which is swept by the fire from the crest; the ordinary terreplein is narrowed, and in its rear, in place of the bomb-proof casemates of customary plan, is a gun slope or bank to facilitate the interchange of guns and the removal of those which may become disabled.

Cover for the garrison is provided by timber blindages in earthen traverses running right and left across the interior of the work, and the magazine, shell stores, &c., are similarly accommodated. The parade so occupied is no longer an open space, and the whole area of the fort is filled with accessories. The traverses on the line of parapet are to be kept down to the crest level in order that no indications as to the dispositions of the work may be afforded to the enemy and the whole is defiladed by a principal traverse dividing the work on the capital. Such a work is intended for the strong independent positions in rear of an army, to secure its communications, or to protract the resistance of a discomfited and overmatched force, and as so designed and equipped could only be taken, the author thinks,—if taken at all,—at a very heavy sacrifice of life.

The figured dimensions to the plates are in mètres, while the scales drawn on them are scales of feet. These scales are not always accurately figured, and hence difficulties arise in reading the plans. The paper closes with a reference to the advantages and disadvantages of works with circular and elliptical traces and some practical suggestions for an "Aide Mémoire" which should "presuppose an engineering education," and instead of consisting of crowds of figures and dimensions, should contain "type-drawings," exhibiting the principles which should control the design and construction of provisional forts, drawings which should bear upon the face of them the necessary written instructions for carrying out the work.

Captain Clarke's paper shows how keenly every move in the great game of war is watched, and what a number of highly-trained intellects are enlisted in the arts of destruction and their antidotes.

VARIORUM.

"Water Supply," by Wm. Ripley Nichols (New York: Wiley & Sons. London: Trübner). Such is the title given to amplified reprints of lectures delivered at the Massachusetts Institute of Technology, and they deal with the subject from a chemical and sanitary stand-point. The chapter on drinking-water and disease is not only full, but candid, and by no means shirks the difficulties which lie in the way of connecting the two. The work is illustrated,

and the subject is one in which all are interested,—in the chapter on household filtration of water (*e.g.*) if in nothing else.——"Riveted Girders and Curved Roofs," by Thos. Timmins (published by the Author, King's-road, Peckham). The object of the writer is to determine by diagrams the strains in iron structures, excluding all algebraic and other calculations. The present volume is one of a series, and deals not only with the design of iron structures, but has much useful information on the qualities of iron adapted for various uses, on the sizes obtainable most readily, and on the mechanical processes, such as punching, drilling, &c., to which it is subjected. The plates are, of course, "of the essence" of the work, and they are full and clear, while tables of weights and safe loads complete a useful book. —— "Professional Papers—Indian Engineering," edited by Lieut.-Col. Brandreth, R.E. (Roorkee: Engineering Coll. Press). These papers, published quarterly, deal with the same class of subjects as their English counterpart, adapted to Indian experience. Architects will find the greatest interest in the paper on the Mayo School of Art at Lahore, designed and constructed by Rai Bahadur Kunkya Lall, M.I.C.E. This building is sensibly illustrated by plans, elevations, and sections on a good scale, and it is highly creditable to its author. The design is based on local traditional styles, and the construction exhibits some familiarity with modern methods. In a short specification which accompanies it there are a few points which read oddly. The brickwork, for instance, is to be "in English bond, without chipping in first-class mortar"; and under the heading of painting and *glazing* there is this,—*only* this,—"All visible woodwork of roof, doors, and windows is *varnished* with two coats of varnish. The ends of timbers are coated with coal-tar to preserve them from white ants" *voilà tout.* Editing is sometimes a process of uncertain execution; and when well done involves more trouble than some persons are aware of.——*L'Art*, July and August (Remington, Bond-street). As usual the etchings are the most attractive part of this publication. The woodcuts are not of very high quality, and the matter is cut up into short lengths, too short for serious use. In an article on the English water-colour school but bare justice is done to the qualities which distinguish it,—and although a drawing, and a very good one,—of Mr. Robson's Galleries in Piccadilly graces the work, no notice of the building is forthcoming. The get-up of the periodical is everything that could be wished. —— Cassell's *Saturday Journal* appears to be designed on something like parallel lines to those on which the *Family Paper* was founded, making due allowance for the enormous development in popular taste which has been effected during the last twenty-five years. There will be an abundance of fiction and amusement in its pages, as well as entertainment of more substantial kind, and as it will not be illustrated, all the available space will be filled to the advantage of its readers. Being a weekly, moreover, correspondents and others will be brought in closer contact than if separated by a wider interval of publication. Messrs. Cassell have, in so many directions, shown themselves to be accurate judges of popular taste, that a weekly journal of this kind coming from them is almost certain to command success.

Miscellanea.

Birmingham Architectural Association. On Saturday last this Association took an archæological ramble to Clent and the neighbouring heights, the scene of the great stand made against the Romans by the Britons, who were led to the field by Caractacus. Later history tells us that Kinver and Wichbury, adjacent places, were outposts of Henry IV., when, in 1405, he pursued Owen Glendower. During the afternoon the Church of St. Clement, at Clent, was visited, and also the ancient chapel dedicated to the murdered infant King Kenelm. After dining together at Hagley the members returned by train to Birmingham.

Commercial Enterprise. — Messrs. G. B. Kent & Sons are announcing to the trade that one of their firm is about to go round the world with samples of their brushes. Mr. Harold Kent will start early in November for the Calcutta Exhibition, thence to Australia, New Zealand, China, Japan, United States, and Canada.

The Restoration of Peterborough Cathedral. — A correspondent writes: — The actual restoration of the condemned parts of the cathedral has just been commenced, in the shape of the laying of the foundations of the two eastern piers. When these eastern piers were demolished it was discovered that they had been standing on no foundation whatever beyond the common surface, composed chiefly of loose rubble. While the excavations to allow of proper foundations for the new piers have been going on, the Dean and Chapter, two architects, and the contractor, have satisfied themselves that the western piers have not been built in the same unsubstantial manner, but though they have not shown signs of giving way as the eastern piers did, their capacity for supporting a higher and weightier tower is doubtful. The removal of about 8 in. of the common surface at the base of these standing piers revealed the startling fact which the demolition of the corresponding piers brought to light, namely, that they are void of foundation. Only the restoration of the eastern piers was included in the contract, therefore it is seen that if the western piers must be replaced, it will be at a considerable additional outlay. Within the past few days the work of laying the foundation has progressed. The strata of rock having been arrived at, it is washed, and 6 ft. 3 in. of Barrow concrete laid on. Upon this come three courses of Potternewton stone, and then the actual piers, which, at every fifth course, have "through-bonders" to insure stability.

The Woes of "House Hunters" are being poured forth in the correspondence columns of the *Daily News*. In the course of the discussion "A Suburban House Agent" has written to say that "There never was a time when houses to let were so superabundant as they are now." "This," says another correspondent ("J. T. B."), "unfortunately, is quite true, but what does it prove? Does it prove that they are houses well built, with convenient rooms, sound roofs, concrete foundations, good drainage, water secured from the frost, and with a respectably-sized garden attached, at a reasonable rent, say 50*l.* or 60*l.* per annum?" The writer adds, "I would suggest that the first step to stop the erection of further shameful fabrics that now desecrate the fairest parts of suburban London should be to impose a licence fee upon all builders, so as to test their substantiality and sincerity; the second, the appointing of a practical and experienced staff of Government inspectors to see that proper materials are used, and houses not scamped in structural requirements."

Fire in Holyrood Palace.—Shortly after eleven o'clock on Saturday night a sentinel on duty in the gardens of Holyrood Palace, Edinburgh, had his attention attracted to a reflection of fire from one of the cellars at the south-west corner of the building. On the alarm being given it was found that several bags of shavings stored in the cellar had caught fire, and the flames were extinguished with little difficulty. The portion of the building in which the fire broke out was that which is occupied by Royalty on visiting Edinburgh, and the cellar was under the Throne Room. Inquiries which have been made as to the cause of the fire lead to the conclusion that it was the result of an accident. The fire brigade was called out, and the flames were extinguished before any further damage was caused than the destruction of the shavings. Who is responsible for the storage of shavings in a building of such historical interest?

Institution of Civil Engineers.—It is announced that the number of members of the Institution on the 20th of August last was as follows:—

Honorary Members	20
Members	1,370
Associate-Members	1,713
Associates	520
Students	765
Total	4,388

Architecture, University College.—Professor Roger Smith will give his usual public introductory lecture on resuming his courses of Architecture, Construction, and Modern Practice, at University College, London, on Wednesday, October 3rd. The subject will be "The Column as an Element of Construction and Design." The lecture will be given at the College, Gower-street, at six p.m., and admission to it will be free. The classes commence the following Monday.

A Hint to Turnstile Makers. — There has been some correspondence in the papers as to the size of the turnstiles at the Fisheries Exhibition at South Kensington. "A Stout Lady" having written to complain that she had difficulty in getting through, "Another Stout Lady" writes:—"The complaint of 'A Stout Lady' is one which will stir thousands of minds. Though I have never been actually 'stuck' in a turnstile, I never pass through one without much discomfort. The reason is that the regulation of all such matters is in the hands of men, and in designing turnstiles men naturally adapt them to the dimensions of their own sex. Men carry the bulky portion of their bodies at a higher level than women. A man of ordinary figure is widest about the shoulders, whilst a woman of ordinary figure is widest about the hips; consequently the turnstile which will let a man through easily will just catch a woman inconveniently. Even a stout man will pass easily through a stile which obstructs a much smaller woman, because the greater length of his legs lifts his bulk above the narrow part of the stile." There should be no difficulty in redressing this, the latest - discovered of "woman's wrongs."

The North Wales College.—The constitution of the College for North Wales, which is to be founded at Bangor, having been approved by the Education Department, arrangements are actively progressing for its opening in January, in order to secure the annual grant of 4,000*l.* which has been promised by the Government. Temporary premises will be acquired, and possibly the Masonic Hall, a commodious building recently erected by Major Platt, will be utilised. Nothing definite is arranged as to the site, but it is understood that Lord Penrhyn, who has from the outset evinced an active interest in the movement, and to whom will probably be offered the presidency of the college, will afford every facility to the executive committee. About 30,000*l.* has been promised in subscriptions towards the building fund, the Duke of Westminster, Lord Penrhyn, Mr. W. Rathbone, M.P., Mr. Richard Davies, M.P., Mr. Hudson, and Mr. John Roberts, M.P., being severally donors of 1,000*l.* In Montgomeryshire and Merionethshire public meetings are being held in furtherance of an agitation to secure a grant of 4,000*l.* for the University College of Wales and Aberystwith.

A Memorial is to be erected in Coventry Cemetery over the remains of the late James Starley, the inventor of the bicycle and tricycle. The competition was open, and sixty-five drawings were sent in. The one submitted by Messrs. J. Whitehead & Sons, sculptors, of Rochester-row, Westminster, London, was selected by the committee and family. It takes the form of a pedestal surmounted by a figure. In the centre is a portrait medallion in bas-relief of the deceased. The memorial will be composed chiefly of granite and Sicilian marble, and will, when completed, stand 20 ft. high.

Improved Middle Class Dwellings.—By reference to our advertising columns (p. xxix.) it will be found that the trustees of St. Mary-le-Strand Estate, situate in the Old Kent-road, are prepared to receive offers for a portion of their estate upon which to erect fifteen blocks of Improved Middle Class Dwellings, each containing ten suites of apartments. Mr. Albert Vicars, of No. 151, Strand, is the architect. At the request of the Charity Commissioners these dwellings are designed so as to meet the requirements of clerks and others of a similar class.

Medals.—At the fifty-first annual exhibition of the Royal Cornwall Polytechnic Society, at Falmouth, on Tuesday, Mr. Harry Hems, ecclesiastical sculptor, of Exeter, was awarded the silver medal for his life-size group, in English alabaster, of "Christ and the Child." The *Plymouth Mercury* comments very favourably upon the work.

Sudden Death of an Architect.—Intelligence has reached us of the sudden death of Mr. James Allsop, a Worcester architect, lately residing in Birmingham, who was discovered lying dead on a seat in Hagley Park. He had just previously been visiting his wife's grave in Hagley churchyard. Death is believed to be due to natural causes.

Surveyorship, Market Harborough.—There were eighty-four applications for this appointment. The gentleman appointed is Mr. F. D. Clark, of Chesterfield, engineer and surveyor to the Newbold and Dunston Local Board.

Fire at Cortachy Castle.—Cortachy Castle, the seat of the Earl of Airlie, but temporarily in the occupation of the Earl and Countess of Dudley, was on the night of the 14th inst. discovered to be on fire, and before the flames could be subdued they had reduced the whole of the new portion of the building to ruins. Of the rooms destroyed the oak room was regarded as the most valuable. It was a mass of elaborate carving in oak, and contained a quaint bedstead of oak, richly carved and gilded,—a piece of furniture very highly valued by the Airlie family. The chapel has also been totally destroyed, also two very fine rooms above it. On the other hand, the dining-room has been to a large extent saved, and its fine ceiling remains almost intact. Another valuable room which has been saved from extensive injury is the library; the books were saved. The main staircase, which was the feature of this portion of the castle, though considerably damaged, may be said to have been saved, and a room known as the King's room is likewise comparatively uninjured. As to the origin of the fire, it appears that the flue leading from the kitchen runs up the wall between the old and the new building. Whether it had been on fire is not precisely known, but the fire was discovered near the mouth of this chimney. It is supposed that some burning soot had fallen from it down a channel in the roof, and, after having accumulated, set fire to some woodwork in the roof of the room in which the fire was first observed. It is stated, however, that there was no room in this part of the building in which a fire had been lighted for a considerable time. The servants, on discovering the presence of the fire, forced open a door behind which it was burning. One of them seized the rope of the alarm-bell, which immediately snapped. He scrambled up through a window and got at the bell, with which he sounded an alarm. The castle had a complete water system for use in case of fire supplied from a cistern erected at Dykehead, a rising ground beyond. The printed regulations for the manipulation of this apparatus were exposed on the walls, but none of Lord Dudley's servants, it seems, made themselves acquainted with their details. The fire was thus allowed, comparatively unchecked, to travel along the roof of the building. The old castle has narrowly escaped destruction.

Basingstoke Archæological Society.—On the 13th inst. the members of this society visited the old historical mansion, "The Vyne," by the kind permission of Mr. and Mrs. C. W. Chute, who conducted them over the house, Mr. Chute giving much interesting information as they proceeded from room to room. Among the objects inspected were some pieces of sculpture in the long West Gallery, while in the Lower Gallery, formerly used as the "Orangery," were seen numerous plaster busts brought from Italy by Horace Walpole. Passing into what was called the Strawberry Hill Room, a number of paintings, chiefly hunting scenes, were looked at, also the tapestry hangings which were brought from Italy by John Chute, an ancestor of the present family. In a mausoleum adjoining the chapel is a marble monument surmounted by a recumbent figure, the work of Banks, R.A., of the date 1760, and on one side is the following inscription:—"To the memory of Chaloner Chute, a lawyer of the first practice, who became the purchaser of the Vyne in 1653, the seat of Lord Sandys, built in the reign of Henry VIII. He was Speaker of the House of Commons in the Parliament of Richard Cromwell, 1659."

Infringement of Sanitary By-Laws at Hornsey.—At the Highgate Police Court last week Mr. Thomas Prior, a builder, was summoned for infringing By-law 97 of the Hornsey Local Board by allowing two houses built by him at Wightman's-road, Turnpike-lane, Hornsey, to be occupied without having given notice to the surveyor of their completion. Mr. R. C. C. White, Clerk to the Board, informed the magistrates that when these dwellings were inspected by the sanitary inspector he found them both occupied, and no water was laid on in either, besides which the sanitary arrangements were incomplete. The defendant was fined 40s. and 6s. 6d. costs.

Artisans' Dwellings for Liverpool.—At a special meeting of the City Council, on Tuesday last, the tender of Messrs. Hughes & Stirling, of Bootle and Liverpool, was accepted for erecting thirteen blocks of five-story buildings, forming 272 tenements, the contract sum being 53,722*l.*

TENDERS.

For sundry repairs to the vacant and other houses of the Licensed Victuallers' Asylum, Old Kent-road. Mr. W. F. Potter, architect:—

J. Bull, Westminster	£172 0 0
T. Taylor, De Beauvoir Town	169 0 0
R. Perkins, Gt. Titchfield-street	153 0 0
E. T. Davey, King's Cross-road	149 0 0
B. Cook, Stonecutter-street	133 15 0
W. Wythe, Dalston (accepted)	132 6 0
C. Dearing & Son, Islington	130 0 0
W. Wells, Paddington	125 0 0
F. Dawes, Peckham	117 8 0

For new buildings at Odams's Wharf, Victoria Docks, for the Nitro-Phosphate, &c., Manures Company. Mr. John Slater, architect:—

General Builder's Work.

G. S. S. Williams & Son	£3,570 0 0
Grover	3,536 0 0
Holland	3,001 0 0
Sharpe (withdrawn)	2,470 0 0

Wrought-Iron Girders.

Patent Shaft and Axletree Company, Wednesbury	£1,451 5 0
Butterley Iron Company, Alfreton	1,330 0 0

Cast-Iron Columns.

Stanton Ironworks Company, near Nottingham	£777 0 0
Clay Cross Iron Company, Clay Cross	696 0 0

For new Pasteurising chamber at the Austro-Bavarian Lager Beer Brewery, Tottenham. Mr. John Slater, architect:—

Sharpe, Bow	£348 0 0
Reed, Walthamstow	342 0 0

For sundry works at St. James's Rectory, Piccadilly. Mr. Gordon M. Hills, architect:—

J. Jarvis & Sons (accepted).

For sundry works at No. 6, Cow Cross-street:—

J. Jarvis & Sons (accepted).

For sundry alterations, and new shop-front, at No. 100, Hoxton, for Mr. T. Pearce:—

J. Jarvis & Sons (accepted).

For erecting a new farmhouse and buildings at Fleet, Lincolnshire, for Mr. W. Christie, M.P. Mr. W. Mills, architect:—

Dawson	
Gilder	£547 0 0
Levesley	537 0 0
J. Moore, jun. (accepted)	500 0 0
	485 0 0

For alterations and additions to Severn Valley Carpet Works, Stourport, Kidderminster, for Mr. J. B. Worth. Mr. John Mossop, architect, Kidderminster. Quantities by Mr. Geo. Kenwrick:—

		Allow for Old Materials.
J. Binnian & Son, Kidderminster	£2,050	... £50
R. J. Thompson, Kidderminster	1,864	... 100
J. Howard & Sons, Kidderminster	1,700	... 84
T. Vale, Stourport (accepted)	1,683	... 100

For the construction of certain drainage works at Southminster, Essex, for the Rural Sanitary Authority of the Maldon Union, consisting of about 1,649 ft. of 9 in. and 6 in. stoneware pipe drains, together with manhole, ventilators, straining-tank, and other works in connexion therewith. Quantities supplied by the surveyor, Mr. Alfred B. Brady:—

J. Newman, Maldon	£165 0 0
R. C. Frimm, Hersham	149 0 0
H. Gozzett, Woodham Walter	145 0 0
J. W. Beeton, Hunstanton St. Edmunds	137 17 6
J. W. & J. Neave, Stratford (accepted)	137 10 0

For the construction of works of main sewerage at Burnham, Essex, consisting of about 4,728 yards of 15 in., 12 in., 9 in., and 6 in. stoneware pipe sewers and drains, together with manholes, lampholes, ventilators, flushing-tanks, gullies, settling and filter tanks, and other works in connexion therewith, for the Rural Sanitary Authority of the Maldon Union, Essex. Quantities supplied by the surveyor, Mr. Alfred B. Brady:—

C. Read, Burnham	£2,798 0 0
J. Newman, Maldon	2,584 10 0
H. Gozzett, Woodham Walter	2,575 12 8
Cook, Bennett, & Thew, Lowestoft	2,510 0 0
J. W. Beeton, Hunstanton St. Edmunds	2,495 10 0
S. Redhouse, Baldock	2,386 0 0
H. Bingham, Headcorn	2,319 11 4
J. W. & J. Neave, Stratford	2,279 0 0
F. H. Colepeper, New Cross	2,207 15 0
W. Wood, Chelmsford	2,199 0 0
R. C. Frimm, Hersham	2,197 0 0
G. Smith, Newcastle-on-Tyne	2,175 0 0
A. J. Catley, London	2,160 0 0
J. Cardus, Acton	2,124 0 0
G. G. Rayner, Bootle	2,115 0 0
Woodham & Fry, Greenwich	2,097 0 0
A. Matthews, Dover	2,076 9 11
R. Nicholson, Southend	2,072 0 0
W. Armstrong, Chiswick	2,050 0 0
J. W. Steward, Southend (accepted)	2,009 7 2
G. Cowdery & Sons, Newent	1,991 15 10

For the erection of thirteen blocks of five-story artisans' dwellings, Liverpool, containing 273 tenements. Mr. Clement Dunscombe, M.A., city engineer of Liverpool, architect. Quantities supplied by the architect:—

Hughes & Stirling, Liverpool (accepted)... £53,722

For paving the carriage-way, Commercial Dock-road, Rotherhithe, for the Rotherhithe Vestry. Mr. Edward Thomas, surveyor. Quantities supplied:—

Mowlem & Co.	
Carey	£1,871 0 0
Turner & Sons	1,854 18 0
W. Etheridge	1,780 0 0
	1,775 0 0

For erecting a gardener's cottage at Morden Hall, Morden, Surrey, for Mr. Gilliat Hatfeild. Mr. R. M. Chart, surveyor:—

T. G. Howard, Mitcham	£269 0 0
H. Knight, Morden	250 0 0
T. Lawrence, Mitcham (accepted)	235 0 0

For sewerage works, York Town and Camberley, Surrey. Contract No. 1. Mr. James Lemon, C.E.:—

Cooke & Co., Battersea	£4,350 0 0
Nicholls, Wood-green	3,999 0 0
Geo. Smith, Newcastle	3,922 3 7
E. & W. Iles, Wimbledon	3,750 0 0
Botterill, Reading	3,575 0 0
G. Kemp, Aldersott	3,457 0 0
Stevenson, Chesterfield	3,431 0 0
Bingham, Ashford	3,369 0 0
H. J. Sanders, Southampton	3,190 0 0
Whettam, Weymouth	3,050 0 0
Martin & Wells, Aldershott	3,027 0 0
S. & E. Collier, Reading	2,790 0 0
Crook & Smith, Southampton	2,745 0 0
R. C. Trimm, Walton-on-Thames	2,678 0 0

For making up new roads (carriageways only) for the Hornsey Local Board. Mr. Thomas de Courcy Meade, surveyor:—

Name of Road.	F. A. Jackson & Son.	Waddingham.	Dunmore.	Pizzey.	McKenzie, Williams, & Co.
	£. s. d.	£. s. d.	£. s.	£. s. d.	£.
Lothair-road, N.	383 4 0	414 10 0	395 0	376 2 3*	406
Lothair-road, S.	524 3 6*	568 0 0	559 0	550 3 6	583
Lynton-road ...	277 3 6	298 0 0	289 15	270 16 4	255*
Cornwall-road ...	427 5 0	427 0 0	438 0	419 19 0*	447
Topsfield-road ...	227 7 0	265 0 0	235 0	223 16 3	222*
Connaught-road	486 16 0*	535 8 10	515 0	517 12 9	541
Venetia-road ...	200 0 0*	234 12 8	235 0	207 4 2	210
Tancred-road ...	188 0 0*	200 10 9	197 0	192 7 0	204
Coningsby-road	155 13 0	175 0 0	165 0	153 4 3*	160

* Accepted.

For erecting coach-house and stabling at Clissold-road, Stoke Newington, for Mr. H. J. Aldred. Mr. A. E. King, architect. Quantities by Messrs. King & Sanders:—

Devereux	
Palmer & Sons	£398 0 0
Watson	345 0 0
J. & H. Cocks	322 0 0
Jackson & Todd	312 0 0
Brightwell	270 0 0
	195 0 0

For alterations at the Carnarvon Castle Hotel and Railway Refreshment-bar, Hampton Court, for Mr. T. E. Dunn. Mr. H. I. Newton, architect, 27, Great George-street:—

Stiling	
Walker (accepted)	£298 0 0
Wheatley & Sons	262 11 0
More & Sons	252 0 0
	187 11 10

Pewterer's Work.—Heath (accepted).
Gasfittings.—Winn (accepted).

For rebuilding the Horse and Groom public-house, Westminster Bridge-road, for Mr. J. T. Sewell. Mr. H. I. Newton, architect:—

Beale (accepted)	£2,127 0 0

For kerbing and making up Simpson's-road, for the Bromley Local Board. Mr. Hugh S. Cregeen, surveyor:—

Davis & Attwood	£256 10 0
E. Pull & Sons	247 0 0
S. Lansbury (accepted)	227 0 0

For the supply of road materials to the Bromley Local Board:—

Guernsey Granite.
John Mowlem & Co. (accepted).
Kentish Ragstone.
W. H. Bensted & Sons (accepted).
Surface Flints.
Thos. Wood (accepted).
A. & E. Bath (accepted).
E. Peill & Sons (accepted).

For the erection of two houses, South Parade, Skegness, Mr. E. Douglas Hoyland, architect, 15, Maze-hill, Greenwich:—

G. Dunkley, Skegness	£1,088 0 0
J. Holmes, Wainfleet	1,025 0 0
J. Crawshaw, Skegness	943 0 0

For erecting mills at Whitechapel, for Messrs. Wallis & Drysdale, under the superintendence of Messrs. Farebrother, Ellis, Clark, & Co.:—

S. J. Scott (accepted).

For the erection of new warehouse, West Ferry-road, Millwall, for Messrs. Bullivant. Mr. G. Vigers, architect:—

Salt	
Newlan	£2,974 14 9
Colls & Son	2,877 0 0
Stimson & Co.	2,766 0 0
Lime	2,700 0 0
D. D. & A. Brown	2,650 0 0
	2,602 0 0

For the erection of two dwelling-houses at Halliwell, for Mr. Emmanuel Brown. Mr. M. Robinson, 19, Acresfield, Bolton, architect:—

Dougill, Bolton	
Maginnis, Bolton	£454 7 6
Dobie & Sons, Bolton	453 0 0
Roberts, Bolton (accepted)	417 0 0
	414 14 11

For alterations in sanitary arrangements at the Royal Surrey County Hospital, Guildford. Mr. William George Lower, architect:—

J. Woodman, London	
A. Franks, Guildford	£425 0 0
W. Smith & Sons, Guildford	334 0 0
G. Crapper, Chelsea	331 0 0
J. B. Woods, Clapham Junction	289 0 0
A. Higlett, Guildford	285 0 0
Edmead & Sons, Guildford	281 0 0
J. Smeaton, Ludgate-circus, London	265 0 0
Burman & Sons, Enfield	227 10 0
J. Knight, Westminster	217 0 0
	207 0 0

For roadway bridge across the River Ouse, at Bedford, with north and south approaches. Mr. John J. Webster, engineer, Stephenson-chambers, Lord-street, Liverpool:—

Contract No. 1.—Masonry, Brickwork, Earthwork, &c.

W. J. Botterill, London	£6,993	0	0
H. Young & Co., Pimlico	5,620	0	0
Maynard & Cooke, Westminster	5,550	0	0
G. Moss, Liverpool	5,464	0	0
G. Griffiths, Gloucester	5,018	9	8
T. Smart, Nottingham	4,999	0	0
B. Cooke & Co., Battersea	4,840	0	0
S. & M. Pattinson, Ruskington, Sleaford	4,217	0	0
G. Smith, Newcastle-on-Tyne	4,182	15	5
F. Nawill, London	4,069	0	0
B. W. Ward, Leicester	4,030	13	4
Pilling & Co., Manchester (accepted)	3,657	18	3

Contract No. 2.—Ironwork.

Head, Wrightson, & Co., Stockton	£4,764	8	0
W. Bland & Sons, Bury (Limited)	4,477	7	6
G. Moss, Liverpool	4,054	0	0
Eastwood, Swingler, & Co., Derby	3,956	13	1
Heenan & Woodhouse, Manchester	3,900	0	0
Handyside & Co., Derby	3,836	4	6
J. Butler, Leeds	3,832	5	0
G. Smith, Newcastle-on-Tyne	3,750	0	0
Pilling & Co., Manchester	3,636	2	4
F. Nawill, London	3,571	0	0
W. Richards & Sons, Leicester	3,564	7	0
Russell & Robertson, Workington	3,529	2	5
Coalbrookdale Company (Limited), Coalbrookdale, Shropshire	3,499	19	0
G. Griffiths, Gloucester	3,491	15	1
Gimson & Co., Leicester	3,446	19	6
H. Young & Co., Pimlico	3,400	0	0
Maynard & Cooke, Westminster	3,200	0	0
S. & M. Pattinson, Ruskington, Sleaford	3,160	0	0
Goddard & Massey, Nottingham (accepted)	3,150	0	0

For alterations and additions at High-street, Finchley, for Messrs. E. & C. Ironsides. Mr. F. D. Thompson, architect:—

D. D. & A. Brown (accepted).

For nurses' day-room, at the Wandsworth and Clapham Union Infirmary, for the Guardians of the Poor. Mr. T. W. Aldwinckle, architect, 2, East India-avenue, Leadenhall-street:—

Jewell	£475	0	0!
Aires	464	0	0
Maplesden	445	0	0
Pain	438	0	0
Avis	410	0	0
Turtle & Appleton	395	0	0
Dean	350	0	0
Lorden & Son	347	0	0
Hancock	252	10	0
Hammond (accepted)	245	0	0!

For the erection of new front, Staffordshire Bank, at Wolverhampton. Mr. W. Doubleday, 67, Colmore-row, Birmingham, architect. Quantities supplied by Mr. George Kenwrick, Birmingham:—

W. Trow & Sons, Wednesbury	£1,012	10	0
P. Horsman & Co., Wolverhampton	996	0	0
G. & F. Higham, Wolverhampton *	922	15	0

* Accepted.

For alterations to bar, &c., at the Woodman, High-street, Sydenham, Kent, for Mr. G. T. Crockford. Mr. Henry Roberts, architect, 113, Lewisham-road:—

Cabinet, Bar-fittings, &c.

G. W. Sly, Greenwich	£360	0	0
H. L. Holloway, New Cross	360	0	0
Hubble & Trott, Deptford	358	0	0
M. Redman, Brockley	355	0	0
J. W. Taylor, Camberwell (accepted)	350	0	0

Pewtering, Gasfittings, &c.

H. Lane, Peckham	£90	0	0
Banks & Co., Deptford (too late)	89	10	0
Ruse, Bermondsey (accepted)	84	10	0

For sewerage works, Great Yarmouth. Mr. Jno. Wm. Cockrill, borough surveyor:—

J. Downey & Son, Norwich	£5,195	0	0!
Grimwood & Son, Sudbury	4,996	0	0
E. Howes, Yarmouth	3,850	0	0
Botterill, London	3,766	0	0
Cook, Bennett, & Thew, Spalding	3,690	0	0
Smith, Newcastle	3,571	0	0
J. F. Bray, Yarmouth	3,228	0	0
Hayward, Eastbourne	2,773	0	0
Want, Yarmouth (accepted)	2,412	0	0!

For the construction of filter-beds, for the Waterworks Committee of the Oxford Town Council. Messrs. Hawksley & Burstal, engineers:—

	Brick.	Stone.
C. Chamberlane	£10,995 17 11	£10,872 2 10
H. Hilton & Sons	10,230 0 0	10,703 0 0
W. Hill & Co.	10,070 0 0	10,112 0 0
G. Smith	9,685 10 8	9,538 4 11
B. Cook & Co.	9,275 0 0	8,930 0 0
C. Baines	9,073 5 0	9,612 10 0
H. T. Kingerlee	8,859 11 10	9,108 5 11
G. Moss (accepted) *	8,610 19 0	8,523 15 2

* Cement and extra brick, 122*l.*; stone, 120*l.* 2s.

For almshouses and villas to be erected at Turvey, Bedfordshire, for Mr. Jas. Barton. Mr. Joseph S. Moye, architect. Quantities by Mr. Arthur F. Wrightson:—

	Almshouses.	Residences.
Hall, Beddall, & Co.	£6,070	£3,197
Higgs & Hill	5,699	2,988
J. Grover	5,548	2,894
Lawrence & Sons	5,430	2,990
Martin, Wells, & Co.	5,200	2,900
Brown, Son, & Blomfield	4,755	2,645
S. Foster (accepted)	4,619	2,506

For the erection of a new packing-room at the Wimbledon Sanitary Laundry, Cranbrook-road, Worple-road, Wimbledon. Messrs. Ebbetts & Cobb, architects, Savoy House, 115, Strand, and Colchester:—

H. Harmer (accepted) £298 0 0

For the erection of new parish church, Adlington. Messrs. T. D. Barry & Son, architects:—

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